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ORIGINAL ARTICLES.

ON THE DIAGNOSIS OF TUMORS OF THE ANTERIOR MEDIASTINUM.

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Read in the Section on Practice of Medicine and Materia Medica, of Am. Med. Association, May, 1884.

It would be difficult to find in the adult human body a region of less intrinsic interest than that space between spaces known to the anatomists as the Anterior Mediastinum. It is narrow and of little depth; at its superior part a small interval is left between the two layers of pleura which bound it; behind the second piece of the sternum, the pleuræ of opposite sides come into contact and it amounts merely to a thin septum; while lower down it is inclined to the left, and widened out into an angular space of some breadth by the recedence of the margin of the left pleura from the sternum (Quain). It is bounded in front by the triangularis sterni muscle, behind by the pericardium, laterally by the reflected borders of the costal pleuræ, and constitutes a sort of physiological no-man's-land, for it is occupied simply by connective tissue save in its upper part where lies, when it still persists, the shrivelled remnant of the thymus gland.

Six or seven small lymphatic glands lie along the course of the internal mammary vessels. They are for the most part beyond the borders of the mediastinal space, but have nevertheless received the name of anterior mediastinal glands. Nor does this space possess, under ordinary circumstances, the clinical importance that has been ascribed to it "as indicating the position of the anterior margins of the lungs relatively to the heart," [1]for it is only upon the fullest inspiration that the pulmonary and parietal pleuræ can come into contact at the mediastinal borders, and the relations of the margins of the lungs to the heart must be determined in the living subject by the methods of physical diagnosis rather than by fixed anatomical lines.

But when we consider the Anterior Mediastinum in connection with the pathological processes to which it is liable and in connection with the new growths which occasionally invade it from surrounding structures, it assumes a clinical importance which is not likely to be over-estimated. On the contrary, systematic writers upon diseases of the chest have too often failed to recognize alike the variety and frequency of the diseases of this region and their importance from a clinical point of view. The students' manuals of Physical Diagnosis, with few exceptions (Gee, Bruen, West,) strangely do not mention them at all. The more pretentious treatises upon Diagnosis and Practice in common use in this country and abroad, for the most part, make the same omission. Important articles have appeared in recent years in the great systems of medicine [1] but much that is valuable is scattered in the journals and reports of societies, and is inaccessible to the majority.

Even those who have most freely contributed to our knowledge of the subject make no formal distinction between the diseases of the anterior and those of the posterior mediastinum. Such a distinction is, I hold, called for by the anatomy of the chest, by the great difference in the contents and relations of these spaces in front of and behind the heart and separated by the middle mediastinum containing the pericardium and its contents, by the different pathological processes to which their contents are respectively liable, by the requirements of accurate diagnosis and finally, by the measures of relief which in certain rare cases become available when, and only when, a differential diagnosis is established.

The morbid conditions to which the anterior mediastinum is liable arrange themselves into two groups; (A) inflammation of the tissues in the cavity, and (B) new growths involving the space and its borders, and are in brief:

A. Purulent Inflammation; *B*. 1. Cysts; 2. Lipoma; 3. Fibroma; 4. Osteoma; 5. Tubercle; 6. Gumma; 7. Lymphoma; 8. Sarcoma; 9. Carcinoma.

Simple acute inflammation of this region terminating in resolution is practically unrecognizable and unknown.

Of inflammation resulting in the formation of solid exudation, a single case is reported, that of Wildemann. The affection resulted from long continued pressure in the sternal region. The anterior mediastinal space was distended with layers of solid exudation.

On the other hand, abscesses are not uncommon. They may be (a) the result of primary inflammation in consequence of injury and sudden exposure to cold, or (b) secondary purulent collections in con-

[1]Quain's Anatomy, Seventh English Edition, p. 229.

[1]See Hertz in Ziemann's Encyclopædia, Vol. V.—R. Douglass Powell in Reynold's System of Medicine, Vol. V.—J. Risdon Bennett, in Quain's Dictionary of Medicine.

nection with operations upon the neck, as tracheotomy, or they may be (c) the result of pyæmia.

Cysts in this region are rare. They are mostly of embryonic origin (dermoid) and contain epithelial structures, such as hair, sebaceous and sweat glands, teeth, and occasionally bone, cartilage and other tissues, together with much sebaceous matter. These cysts occasionally develop rapidly and may attain great size.

Lipomata occur as the result of an undue increase of the mediastinal fat, and are associated with excessive accumulation of fat in the pericardium and elsewhere. Such fatty tumors are rare and of very gradual development.

Fibromata and osteomata occur so infrequently that they may be regarded rather as pathological curiosities than as matters of clinical importance. Exostoses springing from the internal surface of the sternum have been met with. They do not attain such size as would permit their recognition during life.

Tubercular deposits in the anterior mediastinal glands are of much less common occurrence than in the bronchial glands. Occasionally observed after death, they do not during the patient's life-time give rise to changes that render a diagnosis of their true nature possible.

Gummata seated upon the anterior and posterior surfaces of the sternum are mentioned by systematic writers upon syphilis.

Lymphoma, sarcoma, and carcinoma constitute by far the greater number of new growths found in the anterior mediastinum. Conclusions as to the relative frequency of these three forms of morbid growth must be based upon the observations of recent years; many of the older cases regarded as forms of cancer being doubtless lymphomata and sarcomata.

Carcinoma probably never occurs as a primary disease of this region. It is met with here even as a secondary growth very seldom, except when it occurs as a secondary deposit from a cancerous breast.

Primary sarcoma is also relatively uncommon. It may originate from a persistent thymus, from the fibrous pericardium, from the periosteum of the sternum, or from the mediastinal connective tissue. Much more commonly sarcomata of this region are secondary to some similar or associated new-growth elsewhere. In a case of my own the primary disease had its seat in the thyroid body.

Lymphoma or lymphadenoma is by far the most frequent form of growth having its origin in the anterior mediastinum.[1] It arises either in the mediastinal glands or in the thymus, and rapidly invades the surrounding tissues, the neighboring glands, the lungs, the heart, and the walls of the vessels which it may even penetrate.

So rapidly and so completely do the malignant growths of this region implicate the surrounding structures that it is, as a rule, quite impossible to determine even after death the starting point of the disease.

[1] R. D. Powell, M.D., F.R.C.P. Loc. cit., p. 5.

The foregoing morbid conditions differ among themselves as to causation, rapidity of development, associated lesions and other important clinical characters; they possess the common traits that they constitute sub-sternal tumors, and that they cannot be recognized as such until they attain sufficient volume to exert pressure upon surrounding organs and modify the physical signs in the region of the chest. It follows that in their incipiency diagnosis is impossible. Even when they have attained a considerable size and occasion serious symptoms and coarse modification of the physical signs, their differential diagnosis from analogous conditions of the posterior mediastinal space constitutes one of the most difficult problems of clinical medicine, whilst under certain circumstances their diagnosis from aortic aneurism and pericardial effusion calls for the exercise of the utmost care. Finally, the recognition of the special form of disease with which we have to deal is possible only in a small proportion of the cases, and the diagnosis must, in most instances, be of necessity a probable rather than a positive one.

Prominent among the symptoms of mediastinal tumor are, pain, pleuritic in character, commonly superficial, and differing in this respect from the deep-seated, boring pains of aneurism; dyspnœa, increasing day by day and always aggravated by exertion; cough, unproductive or attended by scanty, often frothy expectoration; dysphagia, and a sense of constriction and of oppression in the sternal region. These symptoms, which also occur in other conditions, are characterized by a tendency to paroxysmal intensification altogether peculiar and of itself of diagnostic moment.

Fever is absent, save when it occurs in consequence of some inflammatory complication.

The nutrition is often good, emaciation being present chiefly in those cases in which the œsophagus is pressed upon or implicated. Patients are often well nourished to the last.

When to such symptoms are added certain of the following physical signs, the probability of the existence of mediastinal tumor is correspondingly increased.

Upon Inspection.—Repletion of the veins of the face and neck, lividity of the lips, prominence of the eyeballs, inequality of the pupils, and tumefaction of the tissues of the face, neck, or upper extremities, from serous infiltration; distension of the superficial venous twigs of the upper part of the chest; this often amounts to a mere reddish-blue arborescence, terminating abruptly at or near the sternal borders, but occasionally the superficial veins are enormously enlarged, and form varicose patches of considerable size and prominence; protrusion of the upper sternal region and enlargement of the chest, particularly above the level of the fourth rib, usually asymmetrical; in certain cases an irregular mammilated appearance of the surface, from the protrusion of the tumor through the tissues forming the chest wall; enlargement of the thyroid body, or of the glands at the root of the neck, or in the axillæ, or deformity due to the extension of the tumor upward beyond the sternal notch or the sterno-clavicular articulations;

diminished respiratory movements, often asymmetrical.

On Palpation.—The signs of displacement of the apex of the heart, or great enfeeblement of the cardiac impulse, which often is fluttering and irregular; absence of abnormal impulse or thrill.

On Percussion.—Modification of the sternal resonance, with an area of dullness of greater or less extent, involving the upper sternal region, and continuous with the cardiac dullness; dullness in the interscapular region. If there be extensive secondary implication of one or both lungs, the pulmonary resonance will be modified at points distant from the sternum, and collapse of a lung from occlusion of a bronchus, or pleural effusion will yield their known signs.

On Auscultation.—The modifications of the signs relating both to the heart and lungs are of the most varied and diverse character. The sounds of the heart are usually enfeebled, and their rhythm disturbed. In some instances the heart-sounds have been intensified over regions of extra-præcardial dullness. Murmurs may or may not be present, but they never occupy the position, nor do they manifest either the intensity or the rasping character of those of aneurismal origin.

The respiratory murmur is greatly diminished in intensity over the tumor. Stridor is less common than in aneurism, partly because the pressure is apt to be less directly exerted upon the trachea or bronchi, and partly because the common forms of mediastinal growth tend rather to invade than to merely compress at a single point the tubular strictures with which they come into relation. Great enfeeblement of the respiratory murmur over one side may, in the absence of other cause, be of diagnostic value as indicating obstruction of a primary bronchus.

The general diagnosis of mediastinal tumor having been made, the following considerations would favor the probability of its being in the anterior mediastinal space:

(a) Enlargement of the superficial veins of the chest, especially of those below the level of the upper segment of the sternum.

(b) Bulging of the middle portion of the sternum, especially if resonance in the interscapular region remains unimpaired.

(c) Great obscurity of heart-sounds and impulse.

(d) An amount of dysphagia, slight in proportion to the other symptoms of pressure, or the absence of dysphagia altogether.

The differential diagnosis from aneurism of the aorta would be rendered probable if, in addition to the above data, there be

(a) The history or presence of tumors of a malignant nature elsewhere.

(b) An extensive area of dullness without characteristic pulsation, thrill or bruit.

(c) No evidence of disease of the blood-vessels.

(d) No history of excessive or long continued strain, nor of syphilis.

(e) Pain of a stitch-like character, with sense of constriction, rather than the dull, deep-seated, often radiating pains of aneurism.

(f) And the tumor be developed at a relatively early period of life (before the thirtieth year.)

Blood spitting may occur in consequence of the disturbing presence of any form of tumor, or it may be due to the invasion of a bronchus by a malignant growth. It cannot therefore be regarded as of peculiar diagnostic importance.

Tumors of the anterior mediastinum may be distinguished from pericardial effusion by

(a) The irregular outline of the dullness, the greater transverse diameter of which is at a higher level than that of effusion.

(b) Absence of febrile movement.

(c) Absence of the history of the acute or chronic diseases to which pericarditis is commonly secondary (nephritis, rheumatism, etc.)

(d) The progress of the case.

(e) The absence of diverse and irregularly grouped pressure-signs.

The diagnosis of particular forms of tumor of the anterior mediastinum has hitherto led to practical results, only in so far as regards the presence or absence of a sub-sternal abscess or of a cyst amenable to operative measures. Nevertheless Heyfelder[1] had collected in 1863, no less than nineteen cases of resection of the whole or part of the sternum for cancer, abscess and other cause, of which number a single case only succumbed to the operation. In recent years the successful total excision of the sternum for sarcoma, by Koenig,[2] and successful partial resections of this bone for mediastinal growths[3] lend fresh importance to the subject of the diagnosis of these morbid conditions at the earliest possible period of their development.

Mediastinal abscess occupying the anterior space, yields, before its contents have found vent, the following points of difference from other forms of tumor in this locality:

(a) Etiologically, the history of a blow, knock or prolonged pressure upon the sternum; of a wound or stab; of caries or fracture; of an operation in the neighborhood or in the throat or neck; of suppurative disease elsewhere in the thorax, as abscess of the lung or empyema; of severe constitutional disease, or finally, of exposure to intense cold.

(b) Deep-seated, steady, gradually increasing, rather than paroxysmal pain.

(c) The intermittent signs and active movement of irritative fever.

(d) A tendency to "point" and the appearances of a fluctuating, circumscribed, superficial tumor at the sternal border or at some distant position.

In favor of a cyst the following:

(a) Absence of the etiological data of abscess.

(b) Absence of fever.

(c) Evenness of contour.

(d) Absence of positive signs of new-growth, or associated morbid conditions.

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[1] O. Heyfelder, Traite des Résections, Traduit de L'Allemand avec additions et notes par Le Dr. Boekel, Strasburg et Paris, 1863.

[2] *Centralblatt f. Chir.*, No. 42, 1882.

[3] Küster, *Berliner Klinische Wochenschrift*, No. 20, 1883. pp. 127, 136, 274.

(e) Want of the diversity in the pressure-symptoms met with in the malignant growths.

(f) An obscure sense of fluctuation.

The recognition of a mediastinal fatty tumor would be attended with difficulty, enhanced by the fact that sarcoma of this region may attain considerable size and lead to a fatal issue, without grave impairment of the general nutrition of the body. A woman, aged 60 years, short of stature and enormously fat, died in my ward at the Jefferson Hospital, of sarcoma of the anterior mediastinum, the symptoms of which had lasted almost eighteen months. Kronlein[1] described a congenital lipoma of the anterior mediastinum, in a child aged one year, which found its way through an intercostal space to the surface of the chest, and then rapidly increased in size.

When we come to consider the differentiation of the malignant new-growths which constitute the more common tumors of this region, we find that a probable diagnosis of lymphoma is warranted

(a) When the tumor is primary.

(b) When there are evidences of widespread disease of the lymphatic glands, with or without enlargement of the spleen.

(c) The younger the subject, the greater the probability that the tumor is lymphomatous.

Carcinoma is rendered probable by

(a) The previous or coincident occurrence of cancerous disease in the mammæ or elsewhere:

(b) The presence of hard, nodular, immovable masses in the neck:

(c) Relatively slow development of the tumor:

(d) A tendency to rapid emaciation in the absence of evidences of direct pressure upon the œsophagus.

(e) The occurrence of cachexia.

(f) The intensity and knife-like character of the pain:

(g) A relatively advanced period of life.

(h) A hereditary predisposition to carcinomatous disease.

If the evidence in favor of the other forms be wanting, the diagnosis of sarcoma may be reached by exclusion. This view would be rendered more probable by

(a) Rapidity of growth;

(b) The history of the amputation of a limb, resection of a joint, or extirpation of any organ for sarcomatous disease.

All these forms of malignant growth are alike liable to be followed by secondary invasion of the lung.

I have purposely omitted, in the foregoing paper, the consideration of many of the multifarious phenomena of pressure and invasion met with in mediastinal tumors. The necessity to be brief has obliged me to simplify the subject by serious omissions. I find a further excuse, also, in the fact that each case must be worked out not so much by fixed rules of procedure, as by careful and painstaking analysis of its symptoms.

[1] Langenbeck, Klinic, p. 157.

LIMITATIONS OF PATHOGNOMONIC SIGNS AND SYMPTOMS.

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It has been the writer's intention to bring into this short paper, the results of observations extending over some time concerning certain limitations which must be placed upon signs which are considered, when present in certain states, more or less pathognomonic of a definite morbid condition. The word pathognomonic is not used in a strict sense, but somewhat as the word diagnostic. The writer has so frequently witnessed erroneous opinions as to the nature of disease, arising from the reception of some one sign as absolutely determining, that he has been impelled to write this article to impress more forcibly the necessity of studying all the phenomena present in cases of disease. Those diagnoses which are rightly denominated snap, may at times be brilliant, but he who indulges in them frequently, no matter how well informed, will be sure to make mistakes. Diseases do not follow an absolute rule in their manifestations, and he who would have them always square with the written description will obtain but a partial insight into their nature. As the time allotted is brief, I shall only allude to some of the facts of the nature indicated by the title, and not attempt to cover the whole field of medicine. Moreover, I shall restrict it to this consideration as regards signs.

The nervous system allows of fewer claims of pathognomonic signs or symptoms than do most of the other organs. Yet we find that there is a tendency to accept certain states as proving the existence of a given disease. It was not so long since that many were willing to accept the presence of optic neuritis or choped disc conjoined with headache as characteristic of a cerebral tumor; and the change in intelligent medical opinion on this subject shows how the ground shifts with an increasing attention paid to a subject. At present we would accept the optic neuritis as indication of increased intracranial pressure only, not necessarily that this pressure was due to a tumor; moreover we should place the limitation to this consideration by excluding the possibility of Bright's disease, or of this as capable of explaining all the phenomena of a given case. The writer has on a number of occasions found that those who were thoroughly conversant with the examination of the eye, would alter the opinion expressed as to the cause of an optic neuritis as between disease of the kidney, and intra-cranial pressure with the course of the case and the development of symptoms.

Such a symptom or sign can only be accepted with considerable limitation as pathognomonic.

There seems to be a wide discrepancy in this matter, also, as regards the examination of the fundus of the eye, in cases of so-called congestion of the brain. Some have relied upon a certain state of the retinal vessels as proving that the brain was also congested. Yet here, surely, the margin must be very large, for

the writer has met instances in which patients, who, having the same symptoms during their whole course of medical pilgrimage in New York, and at times abroad, also, have been told that they had congestion by some, anæmia by others. Nor would this be alluded to, in this connection, were it not that some have put forth such extravagant statements upon the certainty of distinguishing in this way these opposed states of the cerebral circulation. Volitional tremor is relied upon, also, as discriminative of multiple sclerosis, yet here we have to consider the possibility of metallic poison, especially mercury, or the effects of alcohol, before accepting the tremor as due to this lesion.

Perhaps the most difficult matter which comes to a physician for solution is coma, and if in this state we could meet with some sign of absolute distinction, we might be delivered from much of the uncertainty of diagnosis. There are those who hold that in this state the temperature of the body will furnish a clue as between uræmia and hæmorrhage; but, unfortunately, some claim an elevated temperature, others a normal, as proper to the former condition. The truth is that we find the temperature too variable to become a guide, though a lowering at the outset, with subsequent elevation, points very certainly, if not with absolute positiveness, to hæmorrhage as the cause of the unconscious state. But we meet here a very decided limitation, in that we so often fail to obtain a knowledge of the initial lowering of temperature.

Others have proposed and would rely upon the presence of albumen and casts, one or both, as distinctive between uræmia and hæmorrhage. Alas! only too frequently disease of the kidney co-exists with cerebral hæmorrhage, so that the presence of albumen and casts are not infrequent accompaniments of the latter of these states, and do not help us in deciding as to the cause of the coma. So, too, if we attempt to find some sign which will distinguish between the different causes productive of hemiplegia, it will soon become apparent that there is no infallible guide. The writer has found those signs which are regarded as pathognomonic, as, for instance, between embolism and hæmorrhage, or obliterating endarteritis, liable at times to mislead, unless their application is limited with certain qualifications. For illustration, heart murmurs may exist, and yet, instead of cerebral embolism, hæmorrhage may be the cause of a hemiplegic attack. The reverse is, also, not infrequently true; a heart murmur is absent, and yet cerebral embolism takes place, owing to the obstructing plug having been detached from a thrombus out of the way of the direct blood current, as in the auricle, etc. So, too, an obliterating endarteritis may cause a sudden attack; in such case the already narrowed lumen is probably closed by a rapidly formed coagulum, and that suddenness of onset which is often considered pathognomonic of embolism, or hæmorrhage, be simulated by obstruction. Neither does the method of recovery upon which others would depend always lead us safely through the maze of possibilities naturally inherent in these cases.

Again, rigidity of the neck through tonic spasm of the cervical muscles, is a valuable sign in cases where a fever or internal inflammation is liable to be confounded with meningitis. It is, however, in no sense pathognomonic, or, rather, admits of considerable limitation.

Beyond those cases where a slight degree of it is present in pneumonia, etc. (of childhood particularly), the writer has found it very markedly present in one case of ventricular hæmorrhage, and in one case of sub-ependymal softening of the lateral ventricle, involving, to a considerable degree, the sensory tracts in their passage toward the occipital lobes. The case was one recently under observation, having severe headache, neuro-retinitis, cerebral irritability, with increasing apathy, to which this symptom became added.

The writer, as others, has been obliged to receive tendon reflexes, or rather their plus and minus changes, with considerable limitations, as indicative of disease. He has found, as others, the normal possibilities too considerable.

Electrical reactions, though much relied on, do not absolutely discriminate the nature of a lesion nor its site; for instance if there is degeneration, reaction present, the lesion may either be situated in the nerves, the anterior nerve roots, in the anterior cornua, or be of uncertain site, as in the case of lead-poisoning. A knowledge of the history and causation is essential to a correct appreciation of a given case.

Illustrations could be given were there time.

In considering pulmonary complaints we find but few signs considered pathognomonic of themselves, but some which in connection with others are regarded as determining.

Thus vocal fremitus is often relied upon as distinguishing between pleural effusion and pneumonic consolidation, where a doubt may have existed, owing to the peculiar combination of signs present. That it has a certain value the writer is prepared to admit, but that it can in no sense be considered as positive, the following brief allusions will illustrate. The writer has met two cases of complete consolidation of the lung with obstruction of the main bronchus by an aneurism in which there was absence of vocal fremitus, etc. Again it is not a very rare event to have vocal fremitus preserved in cases of pleural effusion, nay, even to have it intensified. The writer has frequently noted mistakes made by supposing vocal fremitus preserved, because existing at the upper level of pleural effusions, when absent below. There is perhaps no greater difficulty than is presented by a case of this character in which the bronchial breathing is present to a notable degree. Even the exploratory puncture by the hypodermic syringe-needle has its limitations in these conditions, because it might be possible to have it fail of withdrawing fluid owing to obstruction, leakage, etc., or if withdrawing it, to make sure that it is not because of the existence of a combination of the two diseases. It might be added that the writer has examined some of these cases after death, and became assured that both serous effusion and empyema can, independent of a consolidation, cause increase of vocal fremitus. The limitations then in a

doubtful case become so great that the sign loses a large measure of its force. The limitations of cracked pot percussion note as distinctive of a cavity are so familiar to you all, that it would be a waste of time to repeat them. There may be some, however, who are not familiar with the want of reliance to be placed upon bronchial breathing as discriminating between pneumonia and pleurisy with effusion. It is a very common thing to have bronchial breathing present in cases of pleural effusion, and it follows a certain method and character. It is usually present at the upper limit and has a somewhat sniffling tone, and gives, as compared with the bronchial of consolidation, the idea of coming from a distance. It may, and then usually with these characters, be present over the whole effusion. At times, however, this bronchial breathing is so plain and concentrated that even the best examiners are misled by it into supposing consolidation to exist.

The writer has noticed this mistake more frequently in empyema and in the pleural effusion of inflammatory rheumatism. To make a short digression, the writer will explain one of the causes of this occurring under these circumstances. The patient is hurriedly set up, the physician percusses rapidly, noting dullness or flatness over the lower part of the chest, and then, running his ear over this portion, is struck by finding bronchial breathing, not noting that, as a rule, it is present only at the upper part of the flat or dull region. The vocal resonance is also often misleading, being broncophonic. Hence in teaching it is wiser to state that bronchial breathing is usually due to consolidation resulting from infiltration, exudation, etc., but at times also to compression of the lung. Limitations too are necessary in considering the importance of the signs considered pathognomonic of a cavity. Probably you are all aware that at times the physical signs of a cavity may exist, and yet the lung be consolidated, or compressed by fluid. The writer has been particularly impressed with this in the examination of certain cases of empyema, serous pleurisy and hydrothorax. Under these circumstances he has heard amphoric breathing, whispering, pectoriloquy, and amphoric percussion note over a space in the lower part of the inter-scapular region, and close to the lower angle of the scapula as a rule, which are extremely deceptive or liable to be so, were the observer not fore-warned by previous experiences. Some of these cases have been followed to the autopsy, others into convalescence, in both series the result showed that these characteristics were simulative of a cavity, not evidences of its existence. No very good explanation could be offered for this deviation from the general rule so far as the writer has been able to study it in the cases which have come under observation. The writer would only draw attention to one point in speaking of the limitation of vocal resonance, because these follow the corresponding breathing states to which allusion has been made, and that is to mention the existence of a normal pectoriloquy of which he has assured himself in a number of cases. His attention was first drawn to it by finding that when describing vocal resonance as heard over normal lung in the usual terms, and then presenting some one as an example, that the description, and the illustration would not match, but instead, that articulate speech was distinctly audible over the chest.

The pathognomonic importance of râles as indicative of fluids in bronchial tubes or of changes in their calibre, or in the case of the crepitant, of separation of the sticky sides of the air cells and small bronchioles is but little called in question. Yet there are those who believe that pleural conditions cause certain of these phenomena. The writer has met a few cases where a crepitant râle was present in the initiation of a pleurisy. Hence, beyond the usual limitation of this râle, he would add this as of rare occurrence in his experience. Under such circumstances he supposes that the separation of the sticky pleural surfaces so takes place as to produce crepitation instead of grazing or rubbing. There are few cases which would support the view that the subcrepitant râle is of pleural origin; pleural exudation may be met with in some cases where subcrepitation existed during life, but the writer has seen numerous cases in which subcrepitant râles were present during life, and no exudation was present on the pleura post mortem.

Another sign regarded as pathognomonic is the succussion sounds. There can be no question of its origin from the shaking of air and fluid in a hollow space. The writer has, however, obtained it in several other conditions than hydro-pneumothorax, notably so in cases when from catarrhal or other trouble fermentation occurred in the stomach. He has, however, met with but one instance in which such succussion had led to a mistake in diagnosis. In that instance pneumonia existed, and the physician in attendance was led to shake the patient by hearing a metallic bubbling, and observing the splashing sounds came to an erroneous conclusion. The stomach succussion requires the use of a little more force and is not in all instances readily audible over the chest though heard at a distance. The limitation which it would be safer to place in teaching this sound would be that it might arise from other spaces containing air and fluid, as the stomach. It might be added, that the writer has obtained it in a fibrocystic tumor of the uterus whose walls were gangrenous, in an ovarian sac having a communication with the exterior, and in the intestines largely distended; and that though he has attempted to produce it the case of large cavities in the lung he has hitherto not succeeded.

In the study of diseases of the heart, several important limitations are to be placed upon murmurs as pathognomonic. Not infrequently the writer has met persons with weak heart from myocarditis, degeneration, etc., who had been informed, presumably by competent authority, that they had no disease, because of the absence of murmurs, and of evidence of marked enlargement of the heart. And on the other hand, it is supposed that because a murmur is heard over the heart, or in such a position as is natural to valvular disease to occasion it, that said murmur is due to valvular disease. You are all aware of anæmia, and of respiration, as at times the cause of mis-

takes. The writer would draw attention more particularly to the possibility of aneurism, or of arterial degeneration with dilatation causing a murmur in the aorta above the valves, or behind the heart, and transmitted through it so as to simulate aortic or mitral valvular disease. Notwithstanding one is aware of the likelihood of encountering cases of this nature, or that one under consideration may be of this nature, it will be found at times, examining as carefully as possible, extremely difficult to reach a certain decision between such conditions. At least, it has fallen under the writer's observation that such mistakes were made by practiced auscultators, and he has himself been extremely puzzled by some cases of this nature, and come to a right conclusion only after several examinations; and in two which he met some years since, decided upon the wrong condition. One instance in particular impressed him, because of the small amount of trouble. This consisted of a thrombus about ½ inch long, situated on the aorta, about an inch above the valves, taking its origin from an ulcerated atheromatous patch. The ante-mortem diagnosis by a clever physician was aortic valvular disease, obstructive and regurgitant; thus showing that the pre-diastolic aortic murmur caused by the recoil of blood on the valves, or rather, the arterial systolic, may be mistaken for aortic regurgitation. If a digression be allowed for a moment, it may be in order to point out the necessity of keeping in mind, in such cases, that a murmur just before, and, as with the second sound, above the valves, whilst there is no murmur at such time or during ventricular diastole, should raise a suspicion, at least, that the murmur is produced in the aorta, and not at the valves. Such a consideration has been of great service to the writer in establishing the proper site of murmurs.

Another sign which the writer has heard laid down as diagnostic as between an aneurism or a tumor pressing on an artery or in the neighborhood of an artery, is the presence of a double arterial murmur, this being regarded by some as positive evidence of an aneurism. The writer has paid careful attention to this matter, and has found it fail so often that he regards the proposition as utterly untenable. He has had particular occasion to study it in the epigastric region. In four cases of carcinoma of the stomach or lympho-sarcoma in this region, he has found a double murmur present over this area, and in some of these cases, with no pressure exerted by the examiner. The new growth, as the autopsy showed, pressed on the aorta, and at the stenosed portion not only did a murmur occur during cardiac, but also during arterial systole. It should be added, that marked epigastric pulsation was present in all. In a recent case, the writer found such a double murmur due to a partial stenosis of the aorta by connective tissue going over it. The patient had radiating pains from the spine into the anterior crural and lumbar nerves, evincing pressure on these, considerable epigastric pulsation, to which was added this double murmur, particularly audible when the heart was acting strongly. Another limitation is also necessary in the consideration of double arterial murmur, which has likewise been the cause of difficulty to a number of physicians. This consists in the presence of venous puss in the chest and neighborhood of the aorta. In this latter place it is more deceptive than when found in the neck, though even in that situation, especially in men, the writer has found it mistaken for an aneurismal murmur.

A sign which any physician on first impression would be liable to misinterpret is the severe dyspnœa which at times accompanies Bright's disease. Should one encounter a patient with severe subjective and objective dyspnœa, having at the same time a considerable degree of cyanosis, he would be liable, nay almost certain, to say that such patient had some difficulty with the lungs or air passages primarily or secondary to cardiac trouble. Yet in such condition, independent of the effect of externally received poison, we meet an important limitation, one which is not sufficiently familiar to many physicians. This constitutes the dyspnœa of Bright's disease, or, as some say, the nervous dyspnœa of Bright's disease, asthma of Bright's disease. The writer has met a number of such cases. There is no demonstrable action of the heart; no obstruction in the bronchi; the respiratory murmur is perfect, without the least râle, and yet the patient feels in himself and seems to others in danger of dying of suffocation. In fact, when severe dyspnœa exists, for which the condition of the heart and lungs offer no explanation, this Bright's dyspnœa should be suspected, and the urine examined for evidences of the disease. The writer would be willing to admit that some cases can be plausibly explained upon the nervous theory, but this explanation will not satisfy the conditions when cyanosis exists. How the nervous system could induce this is a mystery to the writer, considering that the patient may be inspiring and expiring forcibly, and the heart is throwing the blood through the lungs and body (at least there is no proof to the contrary).

The idea which he formed when examining a marked case of this kind, was that by some chemical or other change the red blood globules did not absorb oxygen. All cases in which œdema, hydrothorax, etc., exist, are excluded from this category.

The writer will close the paper by drawing attention to two signs upon which it is necessary to place certain limitations. The first is the presence of albumen in the urine. That this may occur from other causes than Bright's disease is probably familiar to all, and that it can be formed in the urine of apparently healthy individuals has been emphasized of late by several observers. The writer knows of no better illustration than one he met a year ago. The patient, a male, broker, had had severe headaches, and on one occasion, for a time, glycosuria. He had had his urine examined in consequence repeatedly, but albumen had not been detected. Coming to the writer's office one morning in consequence of the headache, he was, as is the custom, asked for a sample of urine. This was found loaded with albumen. The morning and evening urine were requested, but these showed no evidence. A series of experiments were made by the patient, some of which are of sufficient interest to detail. The morning urine would be free, but a cool

sponge bath, reading a book or mental exercise, would instantly cause a marked albumenuria. At no time during six weeks' observation could the writer detect casts, or prove that the kidneys were otherwise affected than to allow from different causes albumen to transude. A re-examination after a lapse of six months showed the same condition.

So also casts, especially the hyaline, may be present in the urine for a long time without thereby proving a serious lesion of the kidneys. It is possible that casts may, under certain conditions, form in normal kidneys.

The writer has recently had occasion to examine the urine of a gentleman who has a considerable number of casts, hyaline or slightly granular, coming only after severe exercise. The urine is normal in quantity, specific gravity, and has not contained albumen. The writer has examined the urine passed at other times of the same day on several occasions with negative results, except the presence of mucus and occasionally mucous casts. Only too frequently we are apt to alarm a patient by the detection of what may be considered a sign of imperfect action, yet not necessarily of confirmed or incurable disease, and to pronounce them afflicted with a malady whose very name is a terror.

These illustrations and remarks will suffice for the end had in view, though the same line of consideration could be continued indefinitely.

THE USE OF ANTISEPTICS IN PUERPERAL CASES.

BY MADISON REECE, M.D., OF ABINGDON, ILL.

[Read before the Military Tract Medical Association.]

During one of the hottest days of the month of July, 1881, I was called to see Mrs. W., near London Mills, in consultation with Dr. Wilson, of that place. I found her in a small bed-room, only large enough for the bed upon which she was lying, with but one window in the room. She had been confined a week previously. Her pulse was 160, her temperature 106°, the tongue dry, abdomen distended to the size of a woman at full term, the secretion of milk suppressed. She was delirious, and an odor filled the room like that of a body far gone in putrefaction.

The husband was informed that there was no probability whatever for the recovery of his wife, every symptom indicating a speedy dissolution. However, I suggested a thorough washing out of the uterus with antiseptics. A half gallon of warm water with two drachms permanganate of potash was prepared. After being placed in a proper position across the bed, a gum catheter of the largest size, with several fenestræ in the lower end, was passed up into the uterus as far as it would go. A common Davidson syringe was attached to it by means of a piece of rubber tubing. The uterus was thoroughly washed out, the injection being continued until the water returning was perfectly free from all odor and clear in color. The discharge from the uterus was of such a peculiarly strong odor, that it was impossible to free the hands from it. It was like that one acquires in the dissection of bodies.

Such a change as took place in this woman's case within an hour, I never before saw in any case. Immediately after this cleansing process the delirium passed off, the temperature fell, the pulse came down—in short, the effect was simply magical. She was given twenty grain doses of the sulphite of soda. The husband was taught how to administer the injections, which were to be given every three hours—one of a solution of permanganate of potash, the other of carbolized water, alternately. The patient made a speedy recovery from the severest attack of puerperal septicæmia I have ever seen.

Twelve years before this case, in September, 1869, I was called to see a woman who had had an abortion produced by mechanical means. She had a rapid pulse, high fever, hot skin, unquenchable thirst, irregular chills, an icteric countenance, and a sanious discharge from the uterus that smelled horribly.

A half dozen intra-uterine injections of carbolized water thoroughly administered, rescued her from impending death.

Ever since that time I have used this method in all such cases with similar results with a few exceptions. They are to be regarded as similar to surgical fever, the result of decomposing *débris* in the uterus, which is absorbed from the uterine surface, and which Sir James Simpson has aptly compared to the flap of an amputated thigh, with its raw and bleeding surfaces, and patulous vessels ready to absorb decomposing fluids with which they may lie in contact.

The following long-continued case illustrates, in another way, the value of these intra-uterine injections. The last day of January, saw Mrs. M. A., aged 24, living near Hermon, a strong and vigorous woman. She had been confined 24 hours previously. The child was dead when delivered, and was so much decomposed that portions of the skin slipped from the body when handled. She had had a chill and profuse flooding a few hours before I saw her. The pulse was 140, the temperature 105°, skin hot, tongue dry, and abdomen tympanitic and distended to the size it was before her confinement.

The uterus was immediately washed out with carbolized water, giving great relief to the patient. The injections were kept up every three hours for a week, with the effect of reducing the temperature after every injection. Quinine was also freely administered. Thinking, perhaps, that the septic matter was sufficiently removed from the uterus, the injections were discontinued. Within 24 hours a severe chill, followed by a high temperature, announced the absorption of more septic material. The intra-uterine injections were again resorted to, with the same results, diminishing of temperature, and lowering of the pulse. At the end of a week, as there seemed to be so much improvement, they were once more discontinued. Again, in a short time, there was a chill and return of former symptoms. Again we returned to the use of the intra-uterine injections, and kept them up until every vestige of fever had disappeared from the case for several days.

In this case there was no bad odor from the discharges, as in the former cases, and the effect of the injections in arresting the poison of the septic matter was prompt and striking.

Should antiseptics be used in every puerperal case? I believe so, especially as antisepsis has come to be considered as the use of every means of cleanliness, and the prevention of infectious or contagious matters. And just here let me record it as my fixed belief, that thousands of women have come to their deaths, from the dirt and other matters under the finger nails of their attendants. That dirt, the nest of infectious particles scraped from the body of himself, or possibly bathed in the infectious fluids of another person, is conveyed by means of the touch to the abraded surfaces in the puerperal patient, and she becomes inoculated with the virus that causes her death. I believe that any one suffering from a chronic skin disease, or who is afflicted with a chronic ulcer of any kind, should not attend upon puerperal patients, no more than he who is attending patients with scarlatina or erysipelas. In fact it is my deliberate judgment, that puerperal women should not be attended by the general practitioner at all, and for one I will gladly welcome the day, when I can turn over all such patients to well educated and thoroughly trained lady physicians who will make that their special calling.

Begging pardon for this digression I would say in conclusion that within twenty-four hours after confinement, the use of vaginal injections of carbolized water, affords the greatest comfort to the patient, bathing and soothing the neck of the uterus where there may be abrasions or lacerations, and cleansing and purifying the parts. If the discharges become foul in odor, and there is a marked rise in the temperature, then the injections should be *intra-uterine*. One precaution should be borne in mind, in prescribing vaginal injections, and that is to have the hole in the end of the pipe or syringe closed. I have in several cases seen a severe and dangerous uterine colic, caused by the injection passing into the uterus through the patulous and open os. In the rubber syringes that are sold for female use, I often prepare the pipe for such purposes by closing the central hole in the end, and enlarging the others in such a way that a backward current is given to the injection.

IMPORTANCE OF DIAGNOSIS IN OPHTHALMOLOGY.

BY E. WILLIAMS, M.D., CINCINNATI, O.

Read in Section on Ophthalmology, Otology, etc., American Medical Association, May, 1884.

If a man were seen firing in the air expecting ducks to fall without looking if any are flying over, he would be brought to court on a quest of lunacy. Why should shotgun practice in the medical profession, similarly aimless, be less criminal evidence of a fool? Rifle practice in the healing art requires intelligence and skill. No surer proof of a quack can be asked than a prescription containing a great variety of romantic remedies. Quacks and nostrum venders can kill just as well at long range, and with a shotgun, as with an honest, scientific weapon. The honest, educated physician insists on a personal examination before risking an opinion or prescription. Diagnosis demands knowledge, to which there is no royal road.

The prime importance of intelligent diagnosis need not be argued. Narrow notions of specialties in medicine are a great professional misfortune. How often do expectant students propose to study the eye exclusively, without the labor of a regular course of study and a degree? The only antidote to this nonsense is to insist on a good preliminary education, and a thorough study of medicine, through three to five years. If *then* a specialty is chosen, the choice will be discriminating. In that way only can a foundation be laid in solid rock for a special structure.

The eye is the most exquisite part of the body, and more closely linked with the healthy flow of function in the organism than any other organ. No violinist, however gifted, can become preëminent except he begin the manual training in early years. Shall less be demanded of one who is to play upon the living harp of a thousand strings, with its mixed melody of earthly and heavenly vibrations? Light, nimble and delicate manipulations are eminently required in an oculist. These can only be achieved by handy hands, early, long, and faithfully trained.

But without intelligent diagnosis, even these accomplishments go for nothing. Thorough familiarity with optics, including mathematics, is demanded if anything but mediocrity is expected. No department of ophthalmology is of more practical importance than the anomalies of refraction and accommodation. To a thorough, clear diagnosis in these, the physician must be familiar with physiological optics. The flippant way that practitioners talk about "taking up a specialty," were it not for the tragical consequences, would be simply ludicrous.

The mercenary estimate placed by the public on the faithful army of Esculapius, is due largely to failures of diagnosis and their consequences. With few exceptions, the world don't know the difference between a decent physician and professional robbers. They call them all doctors together. The only way out of this "Slough of Despond" is for all educated, decent medical gentlemen to pool their issues against the bloody and thievish-fingered quacks of all colors and persuasions.

All honor to the American Medical Association for the lofty and only safe ground of its Code of Ethics! No one who lives up to its letter and spirit can ever fall into the dirty ways of irregulars and tradesmen in our noble profession. It is the mean, mercenary spirit that eats out all bowels of mercy and scruples of conscience in a medical man. Broad intelligence and thorough honesty are the qualifications of a true physician. I state a fact, that there are too many medical colleges in this country. It is too easy for the ignorant and unscrupulous to get into the motley ranks of our profession. According to

the *Record*, there are 14 chartered medical schools in the State of New York, graduating annually eleven or twelve hundred students. Some of these many mills must be small, and can grind out from the screenings of the others, dangerous and disgraceful doctors, who, as blacksmiths, would be safe members of society. What is true of New York applies equally to other States.

Reform of these crying evils is timidly seen in the general encouragement to lengthened terms of study, and more thorough preliminary education. But the progress is slow, and too closely watched by jealous and selfish eyes. So-called measures of reform are too often but tricks of the trade. I only speak of these evils, as they bear upon diagnosis and reputable practice, without attempting to suggest remedies. Fewer graduates, of a higher order, are what we need. No advanced step can eliminate *all* quackery, but it will leave behind much driftwood which gives force to the impression that medicine is a trade. Scientific accuracy of diagnosis, and intelligent practice, can best come through thoroughness of study, by educated young men. Correct diagnosis, so important in everything, is peculiarly demanded in ophthalmology. Recent studies of the anatomy, offices and diseases of the nervous system, have thrown a flood of light on some of the most obscure troubles of vision. Language read in the eye is often eloquent in differential diagnosis of diseases elsewhere. The oculist cannot afford to be ignorant of the influence of other diseased organs on the eye. Neither can the practitioner in medicine, surgery or obstetrics, longer get on, without serious knowledge of the settled facts and principles of ophthalmology. Broader investigations and higher knowledge come into demand, just as special studies extend the area of our territorial possessions. Territories belonging to the different branches overlap, and each must understand enough to see mutual relations and diagnostic bearings. A surgeon who cannot tell cataract from glaucoma, or strabismus from deviations following paralysis, will make unpardonable blunders. A cataract operation, where no capacity to see exists, is inexcusably stupid. Every one knows the mutual dependencies of internal pathology and many diseases of the eye. Certain general states, as syphilis, scrofula, anæmia, give rise to the most troublesome eye diseases. Depraved blood, the pabulum of all the bodily organs, is the explanation of many problems in the *ars medendi*. I need only refer to retinitis in albumenuria, diabetic cataract, intraöcular hæmorrhages, toxic amblyopia, and all sorts of specific manifestations in the eye. How often does spontaneous extravasation of blood under the conjunctiva oculi tell the skilled physician of the danger of apoplexy? This, in itself trifling symptom, in advanced years portends grave danger, and ought to be heeded. Conscience cannot be satisfied with prescribing eye water in such cases.

But what has ophthalmology to do with obstetrics? To say nothing of the immediate and remote connections of derangements of menstruation, and other uterine diseases, with serious troubles of vision, I instance pregnancy. The occurrence of albumenuria, in the period of gestation, involves the greatest danger. Puerperal convulsions, the horror of obstetricians, are imminent under such circumstances. Failure of sight from albumenuric retinitis is often the first warning. The retinal changes are so characteristic, that the diagnosis of kidney disease can often be made from them alone. The fatal effects of ophthalmia neonatorum on the eyes of infants, can be seen in all our blind asylums. Nearly half the inmates owe their condition to this disease. Let alone, or treated with old women's remedies, especially if aided by poultices, many of them will lose one or both eyes. This disease can nearly always be prevented. For twenty or more years, I have exhorted my students to wash the eyes thoroughly as soon as the infant is born. The eyes should be opened and clean tepid water made to flow through them, so as to remove all possible poison. This fatal disease is due to inoculation with the mother's secretions. If active gonorrhœa be present, or suspicious discharges, a few drops of a weak solution of nitrate of silver should follow the washing. One to two grains to the ounce is strong enough. This prompt attention will nearly always anticipate the disease. A large number of recent observations in lying-in hospitals, and in private practice, prove this beyond question. Even where the purulent disease has set in, prompt and proper treatment will save the eyes from damage.

The intimate connection of certain eye symptoms with disease of the brain and spinal cord, has long been known. The numerous books and monographs recently published on that subject are nearly all by ophthalmologists. They treat mostly of such phenomena about the eyes and vision, as help to locate the seat and nature of the lesion in the brain. These studies have led to remarkable results in cerebral physiology and pathology. A new field of vast reach has been opened to the study of cerebral localization. The wonderful results of these special inquiries are but beginning to show. A work in German, published in this year, by an oculist of Hamburg, brings together all the known clinical facts about the eye in hemiopia. He desires to show their importance in locating the seat of the brain lesion, be it in the optic tracts or in the visual centres in the cortex.

In the study of locomotor ataxia, much interest has always attached to the two most frequent manifestations in the eye, optic atrophy and extreme contraction of the pupil. The former results, usually, in total destruction of the sight. The latter, when present, persists when all perception of light is extinct. I recall one patient, totally blind for years, where the very small pupils are still the same. In such cases, even when vision is little, if at all impaired, the pupils do not respond to changes of light. But the moment the patient tries to focus for print, the pupils contract, dilating a little when accommodative tension relaxes. The small pupil, when present, indicates the cilio-spinal region of the chord as the chief seat of sclerosis.

Double optic neuritis, generally, means a serious lesion of the brain. If attended by paroxysms of severe head-ache, and sudden causeless vomiting, the

diagnosis of tumor of the brain is next to certain. The most striking symptoms of optic neuritis, are often seen where the sight is little impaired. Double optic neuritis often persists for years, before total blindness, or death, occurs. I recall a poor patient woman, whom I treated five and six years. At last she succumbed to acute pneumonia, never having become entirely blind. Other complications must be looked to in order to form a rational opinion of the seat of disease. But the diagnosis is not always certain, till explained by the autopsy. I have now under treatment a young lady of 18 years, with the most marked symptoms of double optic neuritis I ever saw. She is in fair health and at school. She has had imperfect sight since her third year, and says the defect of vision has been about the same for many years. Her father became blind at 25 and remained so till his death a few years ago. Cause of his trouble not known. The sight of the patient is 0.1 in both eyes. The mother and sister have perfect vision. She can read no 3½ at 6 inches and keep up with her classes. No glasses help her at all. The optic papillæ are enormously swollen and present a woolly appearance. The veins, large and tortuous are less obscured by the opaque tissues, than the arteries. There are no retinal hæmorrhages. The periphery of the fundus oculi is much clearer than its central portion. Our first examination was Feb. 26, 1884. At the second, four weeks later, there was no change. There was absolutely no other symptom to explain this peculiar state of things, than the facts stated. It is quite probable that blindness from optic atrophy will be the final issue.

As showing the frequent dependence of serious ailments of sight upon uterine diseases, I refer to the following: A married lady 27 years old had a large patch of central choroiditis, with corresponding scotoma, in the left eye. The atrophied portion is white, and bounded by a ring of pigment, and she can only count fingers at 8 inches. In the right eye is a more recent choroiditis, with a patch near the macula but small. The vision in this eye is 0.3. She has never menstruated or borne children, on account of the complete closure of the os uteri. Since the catamenial period, she has always suffered with cramps and swelling of the abdomen, at the regular times.

In illustration of the effect of the menopause, in predisposing to bad troubles of vision, I will cite the case of a Miss K. at 55. She is stout and healthy but not plethoric. Seven weeks ago, while reading, she suddenly lost the sight of the left eye. When first seen she could only count fingers at six feet distance.

She has extensive retinal hæmorrhages, with blood coagulæ in the vitreous, but no pain or increased tension. The right eye has a manifest hyperopia of idioptrics. With this corrected the vision is perfect. Her age and pulse indicate some calcareous degeneration of the coats of the arteries. But without the fullness resulting from cessation of menstruation, this fatal trouble would not have occurred.

The sudden seriousness of detachment of the retina is well known. Different explanations of its pathology have been advocated, but that question is not settled. It frequently, but not always, occurs in highly myopic subjects. Now and then eyes of normal refraction are attacked. A man of healthy appearance, 37 years of age, went suddenly blind in the right eye two years ago. The left is perfectly sound and vision normal. The detachment is extensive, and below. About the time this came on, partial hemianesthesia of right side of face and scalp was discovered, and still persists. The derangement of feeling is strictly confined to the distribution of the supra-orbital branch. Lately he has suffered with severe pain in the teeth of his left side. These are the only symptoms. What effect has irritation of the fifth nerve, if any, on the etiology of detachment of the retina?

In some cases of retinitis pigmentosa, a very peculiar disease, there are seen unusual and troublesome complications, that require explanation. I recall a maiden lady with this form of retinitis. One eye was already blind. In the other the concentric narrowing of the field of vision was slowly increasing. In the right eye, already blind, there was confirmed glaucoma. She came to me with an acute attack of the same disease in the left eye. I made at once a large iridectomy, which arrested the glaucoma. Seven or eight years have since passed, and she still sees a little. Final blindness is inevitable, but the evil day was put off by the operation.

Miss B., aged 16, was first seen March 16, 1883. She then had keratitis of fifteen months in the right eye, and three months in the left. The corneæ were hazy and vascular, and the deeper media turbid. With the ophthalmoscope glimpses of the fundus were seen, indicating retinitis pigmentosa. The right eye was convergent and amblyopic. She had experienced night blindness since childhood. The vision of the left eye was 0.3. She had Hutchison's teeth, and the peculiar physiognomy of inherited syphilis. When seen again, in one year, the corneæ were nearly clear, but vision about as at first visit, being able to read ordinary print at 8 inches. There was then contraction of the field of vision, advanced atrophy of both optic nerves, and the usual deposits of pigment in the retina. By this time the media were clear, and we saw the sharply defined, characteristic patches in the choroid, of choroiditis circumscriptæ, as well as the retinal pigment. This case goes to confirm the view that the so-called retinitis may be, primarily, a disease of the choroid. What connection the specific inheritance had with the latter diseases, I do not venture to conjecture.

An only child, 3 years old, born with syphilitic eruptions on the face and body, that were long in disappearing and left scars, was lately brought for advice. The child was rickety, and long in learning to walk and talk. The father has a clear, specific history. For several months the child had been somewhat intolerant of light, but for four weeks the photophobia has been intense. Both corneæ were cloudy and partially vascular from parenchymatous keratitis. It is a case of Hutchison's syphilitic inflammation of the cornea. The diagnosis is certain, though the peg teeth are not present. The result of treatment is yet undecided.

Take the following for its hopelessness and ob-

scurity: M. A., aged 9, a delicate-looking girl, has had marked divergence of the right eye from infancy. With the left she could see well till one year ago, when it began to fail. For the last three months she has lost rapidly in sight. In the right there is absolute blindness, with extinction of perception of light. She still reads Snellen No. 8 slowly, and objects in the outer half of her field are better seen than elsewhere. There is pronounced white atrophy of the optic papillæ. No cause can be detected in the brain or spinal cord to account for it. For two years the gradual failure of sight is the only symptom. Lesion in the nerve centres, not yet revealed by other symptoms, is certainly to be inferred.

For difficult diagnosis, let us describe the case of a German woman, 38 years old, well developed and healthy. About a year since she found that the vision of her left eye was defective. Three months ago the right began to fail. For the past year she has been much troubled with giddiness.

These attacks, with tendency to stagger and fall, have occurred at different intervals, but never oftener than once in two weeks. No nausea or vomiting, but numbness confined to the hands was often felt. She has not menstruated for four years. An enlargement of the abdomen resembles pregnancy, which does not exist. Within a year she has grown very fleshy but lost strength. The vision in right eye is 0.8. With the left she counts fingers only at 6 inches. In this eye the papilla is quite blanched, but in the other it is normal, and the color sense is perfect. The field of vision is quite clear in its inner half, but dim in the outer half. In the left eye, the outer half of the field of vision is totally abolished. She now has frequent and violent attacks of headache. We ordered moderate doses of iodide of potassium, and in two months she returned, quite relieved of the pain in the head. Vision with the right eye was now perfect, or nearly so. The left could count fingers at 6 feet. But the hemianopsia remained the same, as did the ophthalmoscopic appearances. The diagnosis was atrophy of the left papilla, and hemianopsia in the outer halves of the field of vision. This means loss of perception in the *inner half* of each retina. History and symptoms all indicate a brain lesion. The seat of the difficulty is conjectured. Time, and a post mortem may determine the seat and nature of the trouble.

Every surgeon of pretensions, and all mountebanks operate for strabismus, as though the problem of cure were entirely mechanical. The influence of associated convergence and accommodation, in causing strabismus, and the certain changes produced by the progress of years, are not thought of. Immediate results may be satisfactory and remunerative. But insufficiency of the divided muscle, and subsidence of accommodation, will probably lead slowly to great and unsightly divergence, a deformity far worse than the original, and vastly more difficult to relieve. Then again careless and ignorant operators often get no effect, because of inexact diagnosis, not knowing that the case was due to paralysis. Very recently I was asked to operate for squint on a delicate married lady of 36 years. Both eyes were turned far inwards with no ability to rotate either outwards. When but three months old, sleeping in a draft between two open windows, she awoke with the eyes turned in from paralysis of both external recti. Complete paralysis, of 36 years, leads to atrophy of the inactive muscles and rigid contraction of the antagonists. She had never learned binocular vision. No hope can be entertained of restoration to a physiological condition. Hence, no satisfactory result could come from a simple tenotomy, and a tedious operation for advancement, might only result in distressing and life-long double vision. This is the more to be apprehended, as the vision in both eyes was equal and perfect. For these reasons I refused to operate.

A CASE OF EXTRA-UTERINE PREGNANCY.

BY C. N. COOPER, M.D.

Mrs. C. consulted me in October, 1882, for what she supposed to be some uterine disease. She was English by birth, 39 years old, and the mother of four children. She had suffered three miscarriages. Her youngest child was four years old. I treated her nearly three months for subinvolution previous to her last pregnancy. For the past eight months her menstrual flow had been scant, and followed by a somewhat profuse leucorrhœa. She had no flow in September, but when she consulted me, had recently ceased from her October period, and was suffering from dragging pain, lassitude, etc. I found the os flabby and patulous, readily admitting the point of the index finger. The cervical canal seemed filled with tenacious mucus. The depth of the uterine cavity including the cervix was five inches. Three times each week for the first month, and twice each week for the second month, I applied equal parts of tincture iodine and fluid extract ergot to the cervix, within and without, and occasionally carried the treatment to the fundus; also, ordered free, hot vaginal injections at bed time. After two months treatment the uterus had increased to 6½ inches in depth, and the os was still patulous, but the leucorrhœa had ceased. A tumor could readily be felt either within the wall of the uterus or attached immediately to it upon the right side. It did not seem to encroach upon the uterine cavity.

By the first of January the tumor was as large as a pregnant uterus at the beginning of the fourth month. Its position was always on the right side, and freely movable with the uterus. The patient thought she could feel motion within the tumor, yet no fœtal heartbeat could be detected, and the breasts were but slightly enlarged, if at all. The rapidity of the growth, and the fact that somewhat rough manipulation over the abdomen caused some degree of contraction, which was apparent to her as well as to myself, taken together with the supposed motion, led me to the conclusion that the case was one of tubal or interstitial pregnancy. There was considerable pain in the

right iliac region, sometimes extending down the thigh and leg. The patient declined a consultation, and about the middle of January she suffered so much inconvenience, I put her on the use of iodide and bromide of potassium. No special change occurred in the case until the middle of February, when I was called in haste, and found her in apparent labor. Pains had been occurring every five or ten minutes for about two hours. The contracting tumor could not be compelled to retain a central position except when held there. I found the os uteri dilated sufficiently to admit two fingers, and by pressing the mass well down, I could detect a sac bulging from the right side of the uterus. From this time I kept the tumor within my grasp, and increased the pressure during the pains, which now recurred every three minutes.

Within half an hour there was a free flow of water, the os was dilatable, and I could distinctly feel a head presenting where I had before felt the distended sac. I had not long to wait before the head presented at the well-dilated os, and the progress of delivery was uninterrupted. The fœtus was a male of apparently six months' development, though rather small. Life was not entirely extinct, but resuscitation was impossible. The afterbirth was thoroughly delivered in eight minutes. The lochia continued about four days. The breasts did not fill sufficiently to require any attention. The patient suffered no unusual difficulties in getting up, except a constant sore and dragging feeling in the right groin. The tumor did not disappear from the right side for about six months after delivery. On subsequent examination I found no trace of the tumor, neither could I find any indication of a double uterus. All her other pregnancies had been natural in appearance and position. Whether this pregnancy should be called tubal or interstitial I cannot say, but that it was entirely outside of the uterine cavity there is no room to doubt.

The happy termination of this case was certainly rare, and has led me to think of the possibility of operative procedure through the easily dilated os in cases of extra-uterine pregnancy where the fœtal mass is within, or in immediate proximity to, the wall of the uterus.

Batavia, Ill.

MEDICAL PROGRESS.

MATERIA MEDICA AND THERAPEUTICS.

NEW REMEDIES FOR PSORIASIS.—The *British Medical Journal*, in an editorial, gives a very satisfactory review of this subject. Chrysophanic acid still holds a conspicuous place. Its effect in curing psoriasis is undoubted; and if it be not universally employed, it is more on account of the inconveniences connected with its use than from any doubt of its real efficacy. Several ingenious methods have been lately introduced, with the object of remedying these inconveniences. Pick recommends a mixture of gelatine and chrysophanic acid in different proportions.

Auspitz uses "traumaticin" instead of gelatine, traumaticin being a solution of one part of purified gutta percha in ten parts of chloroform. This preparation adheres closely to the skin, and remains from two to three days without change. Gelatine, on the contrary, becomes detached within several days by the rubbing of the clothes or the movement of the limbs. Traumaticin forms a much thinner and more delicate pellicle than either collodion or gelatine, and is more easily borne; and as applications made with the solution of the strength of 10 per cent. have never provoked irritation, even when applied to considerable surfaces, either in children or in adults—the chloroform evaporating slowly, and the gutta percha becoming only gradually hard—it is easy, whilst making an application, to rub it well in upon a considerable number of patches. By means of this rubbing the scales can be removed, and the chrysophanic acid directly applied to the bare and bleeding patches.

The method of Auspitz is carried out in this manner: After the scales have been removed by means of a bath and application of soap, all the patches are dabbed and rubbed with a brush steeped in a mixture of the strength of 10 per cent. If the affection be not extensive, the application is renewed each day. If it occupy a large extent of surface, it is renewed only in two or three days. If the scales be in considerable quantity, a soap bath is prescribed. If the scales be not very plentiful, soap lotions are sufficient. After one or two rubbings many of the patches appear flat, and in general the scales persist only on the borders of the patches. After two, or at the most a dozen applications, according to the intensity and extent of the psoriasis, the infiltration and scales disappear, and in their place are found white patches surrounded with a red or violet-brown border. When the disease is limited in extent, one application renewed daily for three to six days is sufficient to cause the patches to disappear, without the necessity of having recourse to lotions or baths.

M. Besnier modifies this method of Auspitz. After removing the scales, he rubs the patches with a common house-painter's brush, soaked in the mixture of chloroform and chrysophanic acid at 15 per cent. The duration and energy with which the application is made, should vary according to the thickness of the patches of psoriasis. The application gives rise to a slight sensation of heat and smarting; in a few seconds the chloroform has evaporated, and the patch is literally infiltrated with pure chrysophanic acid, having become of the deep yellow color of iodoform. It is only then that, with a large flat brush, the patch is covered with a layer of traumaticin, which must be thickly laid on, and which extends beyond the border of the patch. He has applied this method even to parts covered with hair; it has been found useful chiefly in cases of moderate infiltration, but when the patch is thick, fissured, and desquamating abundantly, the effect is not so striking. In such cases M. Besnier has used, instead of chrysophanic chloroform, a 10 per cent. solution of pyrogallic acid in ether, which is then immediately covered with a layer

of traumaticin, but this latter substance must be applied to the skin with great caution, several cases having been reported in which fatal results followed its absorption.

OBSTETRICS AND GYNÆCOLOGY.

THE APPLICATION OF ANTISEPTICS TO MIDWIFERY.—Arthur V. Macan, M.B., Master of the Rotunda Hospital, treats at some length of this subject in his report of the Rotunda Hospital for the year ending November 3rd, 1883. (*Dublin Journal of Medical Science.*)

The first rule made by him, after being appointed Master of the Rotunda, was that no student who was dissecting would be allowed to enter the hospital; vessels containing a 1 in 40 solution of carbolic acid were placed over every wash-hand basin, and he personally instructed every student who entered the hospital as to the way he thought it necessary to wash the hands. A notice was also put up in every ward, viz., "No one shall make a vaginal examination without having first washed their hands in carbolic acid solution, using a nail brush carefully."

Moreover, to lessen the necessity of making vaginal examinations, and thereby also the risk of conveying septic infection, each student is taught to palpate the abdomen, and soon recognizes without difficulty, except in exceptional cases, not only what the presentation is, but also the exact position of the child's head, back, and limbs. Also every student or nurse who examines a woman *per vaginam* has to write his or her name down on her card, so that if she should afterward prove to be infected the origin of the infection may be traced. This can readily be done, as only four students are allowed to examine any given case. As soon as the child is born, the woman is made to lie slightly on the back to prevent the entrance of air into the vagina or uterus, and there is an absolute rule against touching the woman's genitals with the fingers after delivery, except in cases of post-partem hæmorrhage, ruptured perinæum, or retained placenta, and then only by the Assistant Master. Before stitching up a ruptured perinæum, the vagina is injected with carbolic acid solution (1 in 40), and, should it be found necessary to introduce the hand, the uterus is always washed out with a similar solution. (For some months past a solution of corrosive sublimate, 1 in 2,000, has been substituted for the carbolic acid, with most satisfactory results.) In like manner the vagina is irrigated and the external genitals are carefully washed before every operation, and the uterus is syringed out afterwards, and recently a pessary containing 3jss of iodoform has then been passed to the fundus and left there.

To prevent the possibility of infection being carried by a vaginal or uterine tube, they are all made of glass, and a separate vaginal tube is provided for every bed in the hospital. These, when in use, are kept in carbolic acid solution, and are boiled in the same solution before being again used for another patient. The old India rubber syphon syringes have been entirely replaced by irrigators, which act by gravity, and carbolic acid solution is constantly evaporated in the wards day and night. The old gum-elastic catheters have also been banished, and their places filled by silver instruments; which, both before and after being used, are placed for a considerable time in the hot evaporating carbolic solution.

He never allows any prophylactic antiseptic injections, whether vaginal or uterine, not considering it even necessary to use an antiseptic solution for washing the external genitals, which is done twice daily with plain, warm water, a piece of oakum taking the place of a sponge. Such are the precautions taken against hetero-infection. In auto-infection he attempts to meet two dangers; first, the fœtid discharge, and second, the retention of this discharge within the uterus. For the first, air must have been allowed to enter the uterus. One point of great importance, in order to prevent this, is to make the woman lie somewhat on her back as soon as the child is born. If this be not done, and the pressure of the hand is removed for a moment from the fundus, the uterus falls downwards, a vacuum is formed, into which, if the sides of the vulva from any cause, such as ruptured perinæum, are not in close apposition, air rushes. He insists, for the same reason, on the maintenance of the position on the back for some days after delivery, and the proper application of the binder. This is also of value in preventing an accumulation taking place within the uterus, as the intra-abdominal pressure is greater than when the woman is on her side, and gravity acts more thoroughly. Should the discharge become fœtid *hot* antiseptic vaginal injections are indicated, which cause the uterus to contract. If the discharge be fœtid and the temperature not only becomes high, but remains so for twenty-four to thirty-six hours, then intra-uterine antiseptic injections should be made, and an iodoform pessary introduced. If no signs of inflammation be present, the patient is encouraged to get up on the sixth day as usual. The erect position, by aiding gravity, and putting increased pressure on the fundus, causes the drainage to be more perfect, and the result is, as a rule, that the temperature quickly sinks to normal.

The iodoform pessary includes 3j to 3jss of the drug. It decomposes very slowly and exerts its antiseptic action for three or four days. It has a powerful effect in lessening the temperature. In the antipyretic treatment large single doses of quinine are given, 10 to 20 grains, or the bath at 90° cooled down to 60°, both combined with large quantities of alcohol. This latter measure, however, has only been resorted to once.

To show the effects of these modes of treatment, these statistics give 6 deaths out of 1,090 deliveries during the year. This mortality is *from all causes*, and there was not a single transfer of a puerperal woman to any other hospital. Among these cases there were 62 forceps, 29 breech, 16 abortions, 8 placenta prævia, 5 version, 8 adherent placenta, etc. etc. Barnes' forceps were the favorite, Tarnier's being too large. Hegar's modification of Simpson's modification of Tarnier is well spoken of. 25 cases of post partum hæmorrhage, or only 1 in 43.6, speak

well for the treatment of allowing at least fifteen minutes to elapse before expressing the placenta, the uterus being gently rubbed and kneaded during that time. In 6 cases of puerperal convulsions the treatment was chloroform, morphia subcutaneously, enemata of chloral hydrate (30 grains). Hot steam baths and pilocarpine subcutaneously (⅓ grain) in albuminuria and œdema. Dr. Macan was not able to recognize any constant rise of temperature, even to the extent of one degree, accompanying the first secretion of the milk. The report of the external maternity comprised for the year, 1,335 cases, of which 100 were abortions, 42 breech, 29 forceps, 7 placenta prævia, and 7 adherent placenta.

SURGERY.

THE CONVERSION OF MALIGNANT TUMORS INTO INNOCENT GROWTHS.—Prof. v. Nussbaum, in a clinical lecture recently delivered in Munich (*Wien. Med. Zeit.*), expressed the belief that he had discovered a procedure for the positive cure of cancer by restraining the proliferation of the tissue elements of the disease. It appears to him that a total interruption of all peripheral sources of nutrition is the means best adapted to secure this result. He accomplishes this object by the use of the thermo-cautery, with which instrument a deep channel is made quite around the malignant growth, thus cutting off entirely the supply of blood and other nutritive fluids from the surrounding tissues. The small vessels which ascend into the tumor from the parts beneath are sufficient to preserve its vitality, so that gangrene does not occur. He thinks the thermo-cautery far preferable to the ligature, and that it possesses many advantages over the knife. He regards the hot iron and the various chemical caustics worthy of more extensive employment in the domain of malignant growths than they have ever enjoyed. Prof. Nussbaum doubts not that this circumscribing a cancerous growth, thus cutting off every channel of peripheral nutrition, has a brilliant future, especially in those desperate cases in which death is imminent from hæmorrhage. In his experience, this method of cutting off the peripheral blood supply has afforded such astonishing results that he recommends this procedure to the attention and practice of all those having occasion to treat a case adapted to its employment.—*Birmingham Medical Review.*

PNEUMOTOMY.—The *Medical Times* has been publishing some interesting cases in which pus-secreting cavities in the lungs have been opened and drained externally with considerable success. There has also been an interesting discussion on the subject at the Royal Medical and Chirurgical Society, following the reading of a case in which this operation had been successfully accomplished by Mr. Gould, at the suggestion of Dr. Cayley. The patient was a girl about twelve years of age, suffering from a local gangrene of the lung of acute onset; other remedies had failed, and the girl was rapidly losing ground, when it was decided to puncture the lung and endeavor to drain the cavity of its gangrenous contents. So successfully was this accomplished, that a sequestrum of gangrenous lung was evacuated, and the patient made an excellent recovery. Dr. Biss subsequently related a case in which a basic abscess, with fœtid contents, had been diagnosed and a similar plan of treatment carried out by Mr. Marshall. The case was of a more chronic nature than the preceding, and not so easy of diagnosis. As might have been anticipated, it was less successful, but nevertheless the operation afforded the patient considerable relief during the short remainder of his life, and death was in no sense due to the operative measures adopted. Dr. Fowler gave the particulars of a very unusual case, that of a man who had swallowed a molar tooth. Disease of the lung with formation of a cavity in the base supervened, and threatened to prove fatal. The tooth was not removed, but the abscess was drained with a fair amount of success. Mr. Goodlee, Dr. Broadbent and Mr. Walsham related cases in point. In all alike, the advantages of freely draining away the pus were manifest, even when, from the nature of the case, a permanent cure was not attainable.

The operation consists in opening the abscess cavity, and putting in a drainage tube. It is variously done, either with or without previously incising the chest wall.

Thus Mr. Gould passed in a large trocar and canula, and, after withdrawing the trocar, introduced a drainage tube, and then withdrew the canula, leaving the tube in the cavity. Mr. Marshall cut down on the pleura, and after exposing it, pushed in his trocar to the depth of four inches. Mr. Goodlee, in his cases, excised portions of ribs, and used a scalpel, after having explored with a hollow needle in the first instance. The amount of hæmorrhage appeared to vary, but in none of the cases was it severe, and in none was there any difficulty in arresting it. As regards the pleural cavity, while most of the speakers agreed that it would be better if it had been obliterated by adhesion, some seemed to think that the importance of its obliteration had been exaggerated.

The editor in his remarks inclines to the view that a healthy pleural cavity, could it be diagnosticated, would be a strong contra-indication, as a case within his knowledge proved that the accidental introduction, even of small portions of gangrenous fluid into a healthy, pleural cavity, can be followed by severe inflammation, and possibly by gangrenous empyema.

MEDICINE.

LOCALIZED SWEATING IN LOCOMOTOR ATAXIA.—Besides such phenomena as the altered conditions of the pupils, the gastric, intestinal, and vesical crises, the permanent acceleration of the pulse which has sometimes been observed, the alterations in the secretions of the alimentary canal, the cutaneous ecchymoses and eruptions, and the affections of the nails and joints, which point to an affection of the sympathetic nervous system in locomotor ataxy, we have now added alterations in the functions of the sweat-glands. In the *Revue de Médicine* (*Med. Times*),

M. M. Raymond and Artaud describe the case of a man, aged 46, who was the subject of ataxy, and who presented a well-marked sweating confined to the right side of his face after each meal. This came on in from ten minutes to a quarter of an hour after the meal, and was not associated with any change in the pupil; the sweating occupied the corresponding side of the head and neck, extending to the shoulder. There was no affection of smell or taste, but the patient said that there was increased flow of saliva on the affected side during the sweating. The injection of pilocarpine did not seem to cause more sweating on one side of the face than the other. The authors mention that they have already recorded two cases in which the sympathetic ganglia were found to be affected *post-mortem*, and they allude to Pierret's view, that the central region of the sympathetic lies in the posterior vesicular columns and tractus intermedio-lateralis of Clarke, a region which is very commonly found to be sclerosed in cases of locomotor ataxy.

EXOPHTHALMIC GOITRE.—In the *Ophthalmic Review* Dr. James Russell contributes a case of Graves' disease presenting some features of interest (*Med. Times*). The patient was a girl, aged 16 years, who presented decided exophthalmos on the left side only.

The lids of the right eye were retracted, producing the well-known staring appearance. In the neck there was a very small goitre, alike on the two sides. The mother said that at first the two eyes were equally prominent, and that after a time the right eye went down; though it did not regain its natural appearance, the goitre had varied but very little since it was first noticed. The patient was said to have suffered from palpitation, but made no complaint of this whilst under observation. The pulse was repeatedly examined, and was seldom above 100; it was generally under 90, and several times was less than 80. In a note appended after the paper was written, Dr. Russell states that on subsequent examinations of the pulse the average frequency of the beats had been much greater, being above 110 on a majority of occasions of examination. With this there had recurred a certain amount of exophthalmos of the right eye, though not to the same degree as in the other eye. This case seems to confirm a suggestion made by Dr. Fitzgerald in the same journal, that when the cardiac symptoms are absent the other symptoms should preponderate on the left side.

ON THE VALUE OF ISOLATED SYMPTOMS IN THE DIAGNOSIS OF DISEASE IN CHILDREN.—Politzer (*Jahrbuch für Kinderheilkunde*, Edinburgh *Clinical and Pathological Journal*) gives his experience, extending over more than forty years, in the Vienna Children's Hospital:

Nasal or Palatal Cry.—This is present in ozæna, generally caused by congenital syphilis, and in hypertrophy of tonsils. If not due to either of these causes, it is diagnostic of retro-pharyngeal abscess. The pharyngeal wall should always be carefully examined in such cases.

Prolonged and noisy expirations, with normal inspiration, and no sign of asphyxia, is met with in chorea major.

Sighing inspiration, which seems to originate in the upper part of the chest, indicates cardiac weakness and paralysis, sometimes fatty degeneration of the organ.

Harsh and loud diaphragmatic expiration indicates bronchial asthma.

A pause between the end of expiration and the commencement of the succeeding inspiration, points to laryngeal catarrh, associated with spasmodic laryngeal stenosis, with submucous œdema.

Continuous stridulous respiration from birth, indicates faulty innervation, due to inhibition of the vagus.

Drowsiness occurring in children, is often the first sign of basilar meningitis.

Fulness of anterior fontanelle, with feeling of resistance, is also frequently an early symptom of basilar meningitis. This is generally present in all inflammatory affections of the brain, also fevers complicated with cerebral mischief.

Depression of anterior fontanelle, usually accompanied by sunken eyeballs, shows diminished quantity of blood in the brain.

Slow movement of eyeballs, with a vacant, staring look, points to basilar meningitis.

Violent and shrill cry, lasting two or three minutes, with anxious expression of countenance, occurring an hour or two after going to sleep, indicates "night terrors." It is generally met with in delicate, nervous children.

A periodic cry, occurring during the day or at night, accompanies colic and gastro-intestinal derangement; also, dysuria and painful contraction of the bladder.

Cry accompanying defecation, is generally associated with constipation, and often with fissure of the anus.

A continuous, painful cry, with turning about of the head on the pillow and putting the hand up to the head, indicates otitis.

Persistent crying for weeks, aggravated by handling the child, and movements of the limbs, associated with fever and sweating, probably indicates rickets.

Cry of sleeplessness is often associated with congenital syphilis or chronic indigestion.

A similar cry to the last mentioned is often met with in chronic diarrhœa or purulent discharges, associated with thickening of the blood.

Physiognomy of congenital syphilis is pathognomonic.

Collapse of the nostrils, and absence of alar movement, indicates great hypertrophy of the tonsils.

A disinclination to move may indicate the beginning or existence of spinal paralysis.

Sluggishness of intellect, after brain disease, may indicate acquired idiocy.

Delayed ossification of cranial bones indicates rachitis.

Constant vomiting, occurring when the fontanelles are closed, indicates acute mischief in chronic hydrocephalus.

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SATURDAY, AUGUST 2, 1884.

Partial Optic Nerve Atrophy in Lead Poisoning.—Dr. Uhthoff,[1] of Berlin, publishes two cases of well-marked central blindness associated with normal peripheral visual acuity, which he refers to lead poisoning. Both male patients, one 57 and the other 18 years old. Both came under his observation about a year after the commencement of the trouble. The optic-discs, especially the temporal halves, exhibited well-marked atrophic change, whilst the nasal halves, although paler than normal, exhibited a pinkish color. Both patients were markedly asthenopic, being able merely to count fingers at a distance of six or seven inches, and each eye exhibited a well-marked and relatively large central field of absolute blindness, whilst the peripheral vision was normal. The one of 18 years was a painter's apprentice, and was attacked one month after the commencement of his apprentisage. He had been working with white lead. At the outset his sight seemed to improve, but finally remained in the condition indicated. The other manifestations of lead poisoning disappeared. The difficulty appeared suddenly, and was associated with vertigo.

The second case, of 57 years, was a worker in a rubber factory, in which lead was used. In the years from 1854 to 1868 he had several times suffered from lead poisoning, as exhibited by lead-colic, contracture of the left forearm, pain in the left leg, and later on, emaciation of the left arm. In 1866 occurred a certain mental disturbance which disappeared when he quit his work. In the same year he suffered from a clouded condition of the sight. From this time up to 1882 he was in good health, notwithstanding that he was again at work in the rubber factory. A small fire breaking out in the workshop, he exerted himself to the utmost to extinguish it, and then, overcome by the exertion, he was senseless for a short while. From this time he dated the peculiar visual disturbance, which at the first seemed to improve, but afterwards it remained with a central defect of vision, amounting to about 15° in every direction from the point of fixation. There was developed at the same time with the disturbance of vision a certain stiffness of the legs, resulting in an unsteady gait. The general conditions improved, but the visual anomaly remained, and the pupils were insensitive to light. In neither case was there albumen in the urine.

[1] Beiträge z. Pathologie des Sehnerven, etc., 1884.

Spasm of the Orbicularis and Possibly Cataract Due to Dental Irritation.—Mr. H. Sewill, M.R.C.S., reports an interesting case in British Medical Journal, May 10, 1884, of which the following constitute the main features: A nervous middle aged spinster with facial spasm and neuralgia on the right side of the face and head, associated with spasm of the orbicularis. There was great tenderness in the region of the right upper canine; the neighboring teeth were much encrusted with tartar and the gums were red and swollen. The lens of the right eye is said to be "almost opaque." Dr. Ferrier, who examined the case, supposed that the dental irritation was the cause of the trophic disorder leading to cataract.

Examination of the mouth revealed a vulcanite plate which had not been removed "for years," and together with the teeth was covered with tartar. The whole of the teeth were carious, but the right canine was broken down nearly to the gum with considerable swelling extending upwards over the root. Pus could be pressed from small fistulous openings over the roots of all the teeth. The lower teeth, ten in number, were hidden beneath a mass of tartar which extended a half an inch over the floor of the mouth. Within two days after the extraction of the teeth the spasm entirely disappeared and the patient's health rapidly improved, but no change took place in the damaged lens.

The above case is cited not as a proven case of cataract due to dental irritation, but as at least a not improbable one.

Cholera Report.—The news for the present week from Marseilles and Toulon is more favorable.

Cooler weather has prevailed, and the rate of mortality has been materially diminished. Admiral Krantz, in command of the fleet at Toulon, telegraphed under date, July 28, to Paris, that he is sanguine of a daily diminution in the number of deaths in that city.

Cases are numerous in the suburbs of the cities named, but the progress of the epidemic is not so rapid as we had reason to fear.

The rumor of the introduction of cholera to St. Louis, by the way of New Orleans, is entirely without foundation, as appears from the report of Joseph H. Holt, President of the Louisiana State Board of Health to Surgeon-General Hamilton, of the Marine Hospital Service.

We have reason to believe that the authorities by sea and by land are moving with commendable activity, to arrest so far as human agencies can, the progress of the impending scourge.

ABOLITION OF MARINE-HOSPITAL DUES.—Section 15 of a bill recently passed by Congress, reads as follows:

"SEC. 15. That sections forty-five hundred and eighty-five, forty-five hundred and eighty-six, and forty-five hundred and eighty-seven of the Revised Statutes, and all other acts and parts of acts providing for the assessment and collection of a hospital tax for seamen, are hereby repealed, and the expense of maintaining the Marine Hospital Service shall hereafter be borne by the United States out of the receipts for duties on tonnage provided for by this act; and so much thereof as may be necessary, is hereby appropriated for that purpose."

This puts an end to the collection of a tax on sailors to support the Marine Hospital service, and substitutes therefor so much as may be necessary of the revenue derived from the tax on the tonnage of vessels. The vessel owners, and not the sailors, will hereafter bear the burden of supporting the system of Marine Hospitals throughout the whole of our country.

SEWERAGE EPURATION.—In this and the preceding number we publish the excellent and important paper of Dr. Barnes, presented to a Section of the Suffolk District Medical Society of Massachusetts, on this subject. It was placed on file for the JOURNAL three or four weeks previously, but was postponed from pressure of other matter. At the present time, when so much of attention is given to sanitary matters, on account of the threatened invasion of epidemic cholera, the paper of Dr. Barnes is opportune, and should be carefully read, not only by all engaged directly in sanitary work, but by every practicing physician. For the question how to dispose of the sewage and waste organic material necessarily accompanying the aggregation of the human race in families and permanent communities, in a harmless and profitable manner, is one of paramount importance, not only to large cities and densely populated communities, but also to every isolated institution and family. And no other member of human society can exert as much influence in giving direction to this and every other variety of sanitary work, as the active practicing physician, whose influence extends into almost every household, whether in city or country.

SOCIETY PROCEEDINGS.

SEWERAGE SYSTEMS AND THE EPURATION OF SEWAGE BY IRRIGATION AND AGRICULTURE.

BY HENRY J. BARNES, M.D.

(*Continued from last week.*)

PRECIPITATION BY CHEMICAL MEANS AT COVENTRY, ENGLAND.

Population 40,000. Five thousand water closets connected with the sewers, which discharged 2,289,000 gallons of sewage in the river Sherborne. Complaint and litigation was the result. A reservoir of deposit was constructed, after which the sewage was allowed to filter across a gravel bed three feet thick. This proved unsatisfactory, as only solid matter was taken out, and the court again interfered with an injunction. A contract was then made with a fertilizer company, which agreed to epurate the sewage for fourteen years at $3,750 per year, the company engaging to erect buildings and machinery, and furnish the necessary tools. An extractor first separates the solid matter. The liquid is then run into caldrons under the first group of buildings. Agitators mix impure sulphate of alumina with it at a boiling temperature. It then passes into a second set of vessels, where milk of lime is added and thoroughly mixed, then discharged alternately into four reservoirs in the open air, which are cleaned every fourth day. The liquid thus treated comes out sufficiently pure, and is allowed to filter over about four acres, and finally find its way into the river. Thirty tons of detritus are taken each day from the reservoirs, piled to dry, and subsequently treated by artificial heat. The works are not in operation at night, except the discharge of the sewage on the filter beds. Twenty-two tons of coal, one ton of sulphuric acid, nine tons of sulphate of alumina, and four tons of lime are used each week. The company's net loss is about $7,500 each year.

After long and costly experiments the greatest

"Millions of dollars have been expended in France in chemical experiments on sewage, all of which have been condemned." *J. Babut du Maris.*

chemists have declared that in practice the only manner to epurate sewage is to send it on the land, which eliminates the polluting elements and fertilizing matter for the good of vegetation and the soil. Dr. Angus Smith says: "In all cases the best results are obtained by irrigation." And Dr. Carpenter certifies in a notice read at the International Congress in 1881 "the only way ammonia can be eliminated from sewage is by irrigation."

A commission appointed by Parliament, composed of Messrs. Dennison, Frankland, and Morton, reported: "The actual resources of chemistry do not permit the hope that the polluting matter dissolved in sewage can be precipitated and sent away by any appliance of chemical reaction, and unless new chemical laws are discovered it is useless to attempt the employment of chemical agents. Epuration must be confided to Dame Nature.

At the Women's Prison in Sherborn, Mass., epuration of sewage is attempted by what is known as Colonel Waring's method. Five acres of land are here employed, in the water-shed of Lake Cochituate, about two miles from the lake, with which it is connected by a brook, one of the tributaries of Boston's water supply. The sewage is distributed over the land by tile-drains with broken joints laid fourteen inches below the surface, five feet apart. The effluent drainage is provided for by cross sections of tile laid five feet under ground, which after collecting the water, discharge in the brook. This system is said by the prison authorities to work satisfactorily.

"The water coming from the ground is as clear as spring water, and was selected by an expert as such on inspection." This only indicates clarification, and we regret that analyses made were not published, as no one seems to know where they are at the present time. There can be no doubt but the grass, which is the vegetation on the land, takes nourishment from the sewage, for the lines of drain are clearly marked by a better growth directly over them, which does not extend to the intervals between. One of the defects of this system has already been experienced. Insoluble matter has filled the interstices between the tiles, and prevented fluids from passing through, necessitating their being taken up and relaid. At a depth of fourteen inches the influence of vegetation and the infusoria must be lost on much of the sewage, which was probably disclosed by the analyses, rendering it desirable, that they should be pigeon-holed. (Since writing the preceding a visit to the prison more than confirms the anticipated objection to the system). And the following analysis obtained in the office of the State Board of Health is proof beyond dispute that the system amounts to nothing by way of purifying the sewage, and that it is practically a mammoth cesspool, the contents of which the citizens of Boston must drink:—

WOMEN'S PRISON SYSTEM. PARTS PER 100,000.

	Ammonia.	Alb. Ammon.	Chlorine.	Residue.
Supply End.	.240	.018	9.58	68.5
Flow End.	.232	.034	9.22	69.0

The exclusion of air from the sewage of this system keeps it fresh, the nitrogen is in an organic state, and consequently of no use to vegetation. A fertilizer should become ammoniacal by decomposition before it is possible of assimilation by plants. Analyses of sewage in Europe reveal the fact that there is no loss of fertilizing material in a closed conduit having a run of seven and one-half miles. And examinations of the soil of sewage farms show that in all instances the sand one foot below the surface is as pure and white as that where irrigation is not practiced.

In the Mystic valley the sewage of tanneries has for several years been pumped by the city of Boston into reservoirs of deposit obviously too small to eliminate even the matter in suspension. From the tank there is an overflow into a shallow ditch several hundred feet long, in which are set several brush dams, after which it discharges into the Mystic lower basin. The result of this treatment is to start putrefaction by warmth and free exposure to air, and thus produce a stench which people living in the vicinity claim has greatly reduced the value of real estate. It does not merit extended description, as the effort thus far made merely amounts to a flirtation with the subject.

A few of the farmers living along the Blackstone river are beginning to appreciate the valuable fertilizing material conveyed by the current from Worcester, Mass. One farmer states that his meadow lands which were practically abandoned, it not paying to harvest the grass, now produce crops which add several hundred dollars a year to the value of his farm. Others are placing obstructions in the river, with the object of turning the water on the land.

During the past ten years sanitarians and engineers have made great progress towards a solution of this question, and it is fair to presume from the great increase in the number of cities and towns that have adopted irrigation and agriculture as the means of purifying sewage that this method has proved the most satisfactory. Berlin has two large farms devoted to this object, one of 2035 acres and another of 1818 acres. A great many chemical experiments were tried before the adoption of the present system. They proved very expensive, and none purified the water, although many clarified it. Finally, after experimenting in irrigation and agriculture for eighteen months on a little field of about three hectares (less than seven and one-half acres), such favorable results were realized that this system was adopted for the city, the eminent Virchow working heartily in its favor. At the present time 1067 acres suffice to purify 15,060,000 gallons per day, the drainage of four-fifths of the city, containing a population of over 600,000. There is some odor at the opening of the large sewer, but in the fields there is no smell, and the sanitary condition is all that could be desired. There never has been any complaint from the numerous adjoining habitations, and the effluent drain water of the farms is pure and clear, it being impossible to recognize by microscopy or chemistry any influences of the sewage. Vegetables and fruit trees grow luxuriantly on the land, and their roots make a perfect filter. Thirteen and one quarter tons of hay

have been cut per hectare (a little less than two and one half acres).

Dantzic, situated about three miles from the Baltic, on account of pollution of its harbor at the mouth of the Vistula, constructed a sewer to discharge on a sandy island having little or no soil, where the occasional tufts of grass were frequently covered with sand carried by the wind. As a result, the island is now in a high state of cultivation. In some parts the land rents to peasants at from twenty to thirty dollars per acre. The frosts of winter do not interfere with the successful operation, as the water delivered by the sewer melts the snow and ice, so that it finds its way into the ground quite as well as in summer, and without injury to the slumbering vegetation. Odessa, Breslau, and Florence also have sewage farms. M. A. Durand-Claye, from whose reports this information is derived, says that "in Germany, it is admitted without question that municipal healthfulness depends upon three principles: first, the total discharge of water-closets in sewers; second, the distribution of an abundant supply of water in dwellings, and frequent flushing of drains; third, the purification of sewage by soil and vegetation."

In England, there are two hundred cities and towns disposing of sewage by irrigation and agriculture. On the farms at Edinburgh are located beautiful nurseries for the children of the city. At Lochend, a farm taking sewage from this city has produced $200 worth of hay per acre. The Metropolitan Sewer Company of London rents land at $100 per acre for grazing. Sixteen acres at Rugby furnish feed for fifty-four head of cattle, and at Aldershot, Branbury, Bedford, Croydon, Norwood, Warwick, and Worthing, the reports in detail show an equally wonderful production from the land treated in this manner.

Leamington, with 26,000 inhabitants, spent $40,000 in chemical experiments, after which the A. B. C. Company, in 1869, attempted to purify the sewage, but gave it up in 1871. It was then allowed to flow into the river Leam. A lawsuit followed, costing the city $25,000, in which it was defeated, and compelled, at an expense of $7,500 more, to purify the river. Lord Warwick then consented to receive the sewage on his estates, the city contracting to deliver it at the highest point of the farm for a period of thirty-two years, for which Lord Warwick engages to pay $2,250 annually. The sewage amounts to a little over 1,000,000 gallons per day, and is distributed over the land, which has not been leveled, by what is known as the "donkey back" system,—elevated open drains, on the sides of which is the vegetation. It has transformed the poorest parts of the farm into soil of much fertility, and financially has proved a great success. From eight to nine cuts of Italian rye grass two feet high are made each year. Celery, strawberries, and currants grow remarkably well. The beef, milk, and butter is in great demand, and bring the highest prices. The laborers are in the best of health, and Lord Warwick has received numerous prizes and silver cups for one of the best kept farms in the kingdom. A more detailed account may be found in Babut du Maris' work.

The Sewage farm at Croydon is surrounded by beautiful villas, it being a fashionable resort. The land which twenty years ago sold for about $300 per acre, is now worth from $2,000 to $5,000. There has been but one complaint of the farm during the past twelve years, and this resulted from excessive irrigation during a long period of stormy weather, when the hay could not be dried on the land.

A public footpath crosses the sewage farm at Abingdon. There has been no complaint from bad odor.

Babut du Maris says: "It has been claimed that prolonged irrigation will produce disease by the presence of bacteria in the sewage. Experience is to the contrary. The farms at Edinburgh have received the sewage for over two centuries, that at Buntzlau for two and a half centuries, and for more than ten centuries it has been in practice in China. Vegetation has never ceased to be vigorous and healthy, and the inhabitants have never been known to suffer in consequence of irrigation."

I am informed by a gentleman who has resided seven or eight years in China that in all the large cities the detritus is carried into the suburbs by hand buckets and deposited on the lands for the benefit of vegetation, and in many instances the same pails serve to bring back drinking water, with no ill effect except in a few northern cities, where the sewage is put on the leaves of vegetation; there the tape-worm is very common. Dr. Williams, in his work entitled "The Middle Kingdom," does not include typhus, typhoid, scarlet fever, or diphtheria in a list of the prevalent diseases of China.

It is difficult to make comparisons or draw conclusions when considering this question financially, for the paramount objects to be attained vary in different communities. One town may seek only to get rid of the sewage, another its most profitable employment on the land, another relief from the pollution of a water-course or preservation of its navigability; grotesque and unprofitable experiments and local conditions all contributing to make balance sheets of great diversity in showing either profit or loss. Many examples of each are available, and should of course be carefully studied.

The city of Paris, for many years harassed by constant complaint and litigation as a result of discharging sewage in the Seine, some years since established sewage farms on the plains of Gennevilliers, the history of which is told in a report to the municipal council by the sixth Commission appointed to treat with the state for the concession of such public lands at Achères as are necessary for the epuration of the sewage by irrigation and agriculture.

ORIGIN OF THE QUESTION.

Before the execution of the measures conceived by M. Belgrand for the general healthfulness of Paris, the rain water and the washings of the streets flowed into the Seine, either directly, or by a great number of drains emptying on the quays of each bank the whole length of Paris. This mode of drainage resulted in the immediate and pronounced pollution of the water in the river, which reached the maximum at the point where it leaves the city. The work of Belgrand had for its result the concentration of four-fifths of the drain water in a large sewer opening into

the river at Clichy, while the remainder was discharged at St. Denis. At the same time the water for domestic supply was largely increased. In 1860 30,000,000 gallons per day were furnished for this purpose; in 1882 92,000,000 gallons were required each day, or 34,020,000,000 gallons per year. This, with the rain water which falls on the city, estimated at from 9,576,000,000 to 11,340,000,000 gallons, makes a total of 44,100,000,000 to 45,360,000,000 gallons, which, were it not for evaporation and other loss, should be carried by the sewers. This loss amounts to something like 18,900,000,000 gallons per year, as indicated by gauges in the two sewers, which register 26,208,000,000 gallons,—about 42 per cent. disappearing by evaporation. At low water of the Seine it is equal to one part of drain water to twenty of river water, and at high water to one part in 350. As a result of currents and obstacles in the river, mixing did not take place; and the right bank—the most densely peopled—received on a very long margin the totality of the drain water, depositing all the way organic matter brought in suspension. Protestations from people living along the right bank of the river followed very closely the opening of the two great sewers; and the state government required the city of Paris to seriously consider methods of purifying the sewage before discharging it into the river. The savants, engineers, chemists, traders and agriculturists discussed the subject in all its phases, and to the latter we are indebted for practical solution of the problem.

Filtrage was naturally the first system to be tried. It was soon found that, besides the actual difficulties of filtration on so large a scale, this mode of treatment had the capital vice of leaving in the water soluble organic matter capable of fermentation, and later, chemical agents were resorted to with the object of precipitating the soluble matter, but only incomplete results were obtained, which were slow, costly, and inapplicable on so large a scale.

We now come to the experiment which after fifteen years of study and persevering effort has given a result most complete and satisfactory. Epuration and utilization by agriculture, and filtration by spreading the sewage on permeable land have accomplished this end. It is based on simple principles, of which the demonstration is now made. All argilo-silicious and permeable soils sufficiently thick and well drained, have the property of retaining in their superior layers all the organic matter in suspension and solution contained in drain water spread on the surface of the land. It can receive without being made damp or marshy one inch of water per day, or twenty-six feet per year. It transforms the retained organic matter, rendering it capable of assimilation by plants. A very ingenious experiment just made shows this valuable property in the vegetable mould. A hollow column two metres in height was filled with earth in a manner to reproduce exactly the soil as found at Gennevilliers. Through this was passed sewage in a relative quantity to that employed in irrigation and at equal intervals with its use on the land. Epuration took place as completely as in the natural earth. Chloroform was then passed through the column, which at once arrested epuration, and the sewage traversed the column without being purified. Paralyzation of the infusoria stopped oxidation of the organic matter. This experiment has been demonstrated by M. Schloessing, and is described in the report to the Council of Hygiene. If the surface irrigated is under cultivation the fertilizing matter is immediately utilized; if not, it accumulates without loss and transforms the poorest soil into land of extreme fertility.

A very large proportion of the water used in irrigation is evaporated either directly or by the plants in vegetation. The residuary water coming from the subsoil drains is of a remarkable purity, and does not suggest either by aspect or composition the sewage from which it proceeds. Irrigation is the most economical and efficacious means of conveying directly to the plants the fertilizing matter of sewage.

Trusting in these principles, and fortified by the works of Messrs. De Freycinet, Schloessing, Marié-Davy, and Frankland, the engineers of the municipal service have, since 1867, pursued studies and made experiments for which, notably since 1872, the council has furnished a large amount of money. These efforts have had as a result the great and actual demonstration at Gennevilliers, which evidence impresses favorably all unprejudiced persons who take the trouble to visit the lands.

After some experimental cultivation at Clichy in 1867 and 1868 the irrigation of the plains of Gennevilliers was begun in 1869 by Messrs. Mille and Durand-Claye. In 1870 and 1872 the territory comprised but a few hectares. It has increased each year, until now over 400 hectares are thus employed (about 1200 acres, which receive nearly one fourth the sewage of the city). In the beginning the water distributed was limited to a few thousand cubic metres. In 1872 444,000,000 gallons were used. In 1881 4,685,000,000 gallons were discharged on the land. In May of this year (1881) 684,300,000 gallons—22,050,000 gallons per day, or 44,100 gallons per hectare per day—these plains absorbed. In 1882, at the time of the report, the distribution reached 34,020,000 gallons per day, or 79,300 gallons per hectare, which represents a sheet of water spread over the surface equal to a little over one inch per day.

The progress, the slowness of which astonishes us now, has not been obtained without difficulty. At the origin, the engineers, relying too much on the very great permeability of the land, had not thought it necessary to establish subsoil drainage. The natural drainage, in consequence of an abundant irrigation, was found insufficient. The level of the subsoil water rose; a few cellars were flooded at Gennevilliers, and gravel quarries were inundated. This was sufficient excuse for a claim for excessive damages against so rich a victim as the city of Paris. To increase the indemnity and to compel a compromise, all possible arguments were employed. Doctor was opposed to doctor, and hygienist to statistician, when it was only a question of a few thousand francs damage to the claimants. These demands were opposed by the engineers, who in

turn were very decidedly sustained and supplied with money by the municipal council. The necessary work to insure the drainage of the plains and to remove all pretext for damages was done, and to-day the complaint is rather of the lowering of the subsoil water. Nevertheless irrigation at Gennevilliers created a prosperity until then unknown, and a time arrived when the community, frightened by the possible result of its demands and outcries,—which threatened to be the suppression of irrigation,—asked for a contract, the principal article of which was that the city should engage to continue irrigation on the plains of Gennevilliers for twelve years.

The efficacy of this system of epuration is manifest, and presents a brilliant proof. The effluent drain water has fewer micro-organisms than the water of the Seine when it enters Paris. It has the purity of spring water coming from the earth. To demonstrate the utility of the system as applied to agriculture has been slow and difficult, and not less laborious than the efficacy of epuration. For the latter the analyses made by the savants were proof beyond dispute, for the former the concurrence of the humblest practitioner; and it required time, much time.

The slowness of experiments in agriculture may be understood when we remember that to reach an end we must go through all the phases of vegetation, from the sowing of the seed to the harvest. Under our climate it is a campaign a year. If we neglect a detail, if we make a mistake at the time of sowing or planting, at the time of plowing or watering, the harvest may be a failure, and we must begin again. The difficulty was increased by local circumstances. Amongst the cultivators of land in the suburbs of Paris, no one knew the practical working of a sewage farm. One of the persistent workers who had been rewarded by success said recently that it required more than four years to acquire the necessary knowledge. To-day our cultivators are in complete possession of their art, and in the recent horticultural exhibition every one admired the remarkable products which received honorable distinctions.

In agriculture, successes which would be shown by beautiful samples obtained in the fields of experiment would be objects of curiosity. It is necessary to secure economical results, and these go far beyond the utmost expectations. For the landlord of the soil the rent value of the hectare has increased fivefold — from 90 to 450 francs. For the farmer or cultivator the prosperity has not been less. The net value of vegetable products rose from little or nothing to 4,000 francs per hectare.

In a sanitary point of view, the results have not been less satisfactory, and here again it is necessary to observe the facts on the ground. One sees a numerous population, robust and healthy in proportion to its prosperity. Its vigor assures a healthy nutrition equivalent to its works, which is the best hygiene.

As to the effects of irrigation, the same occurs at Gennevilliers, which always takes place where irrigation is practiced: from the moment it is made frequent, without stagnation, and at regular intervals, a condition which is far from favorable for the development of paludal influences. The determining causes are eliminated; a constant activity is maintained in the vegetable life, which absorbs in its circulation all its own residues and all the organic elements placed within reach. Highly to the honor of the city of Paris be it said that, by the perseverance of its representatives, by the science and devotion of its engineers, the problem of epuration of the residues of cities and of their utilization by agriculture is absolutely and definitely solved. We have no longer the experiment of Gennevilliers; we have a system permanent and regular for the future.

The population of Gennevilliers has increased by farmers coming to occupy the lands, 34 per cent. in ten years.

Among the city documents of Paris lately presented to the city of Boston, and placed in the Public Library, may be seen photographs of the departments of this branch of the municipal service, as well as of the products of the land. The commission, in recommending the acceptance by the city of the terms which the State proposes for the extension of the work so as to include the sewage of the entire city, recommends a municipal ordinance which shall require all the water-closets in the city to be connected with the drains, and an absolute abandonment of cesspools, which now are so common in Paris. Up to the present time the city has declined to accede to the terms of the State, as they are deemed too exacting, and require a very large amount of money for the purchase of the land. The success of epuration by this method is not questioned. "The work of Babut du Maris, lately published, says "the city has just obtained 2,500 acres for the extension of the sewage farm."

The highly satisfactory operation of this system at Dantzic, where the rigorous climate of winter is as great an obstacle to overcome as here in Massachusetts, is sufficient proof that frost is not an objection to its employment on our soil. The land freezes four feet deep at Dantzic. The Vistula is frozen over from the middle of November to March, yet the temperature of the sewage at the mouth of the sewer never goes below 37° F. Irrigation is continued throughout the year with quite as much success in epuration in winter as in summer, although vegetation flourishes but four out of the twelve months.

Sewage in freezing, says Babut du Maris, eliminates its dissolved fertilizing material as thoroughly as salt water eliminates salt by the same process.

There must be abundance of land in the valley of the Blackstone, the Merrimac, and the Connecticut suitable for farms of this character. There is land bordering on Lake Cochituate well adapted to farming, for the protection of the lake from the sewage of Pegan Brook. In Arlington, Belmont, and Medford are vegetable farms favorably located, and soil well suited to this system; and before the community embarks in a scheme to build a metropolitan sewer from Natick to tide-water, which, when finished, will be of doubtful utility, judging from the experience of London, this system should be tested with the object of requiring each and every community to take care of its own sewage.

We have in the soil a chemical laboratory, a perfect filter, oxidation, vegetation, the influence of animal life and the infusoria combining to protect the subsoil water, and so far as experience goes or chemical analyses can demonstrate, these processes of nature are amply sufficient.

We do not hesitate in covering our fields with fertilizing material where are located springs and wells. We are only solicitous lest the surface water should convey the material to them, and we raise an embankment above the level of the surrounding land, and otherwise leave to nature the protection of our drinking-water with full confidence in "*vis conservatrix naturæ*," and if her processes are not complete and perfect the whole world is gradually becoming saturated with filth.

STATE MEDICINE.

CHOLERA-RESEARCHES OF DR. ROBERT KOCH.

Translated from the *Courier des Etats Unis.* By S. Pollak, M.D., St. Louis.

MARSEILLES, July 10.

At a conference of physicians with Dr. Koch at the Pharo-Hospital, a careful microscopical examination was made of the microbes, which Dr. Koch brought from India.

He was asked whether he ever found the microbes in the blood. Never, was his answer. He demonstrated that the choleric microbes are half as large as the typhoid microbes, and have, besides, an oblong form. He found them in the most fulminating cases of cholera. In no other epidemic disease did he find the microbe so characteristic as in cholera. The microbe is not sporous. It is a scissiparitous product, it lives in an alkaline liquid; is destroyed by acidity, and still more by siccity. Three hours of siccity suffice to kill it in the dejections. Its channels of introduction are the mouth, the digestive organs, and the intestines. If it is in the air, it is soon reduced to a powder, and enters the lungs, without harm. In the intestines it multiplies rapidly.

When asked by the President of the Sanitary Commission about prophylactics, he said, that the bacilli live in water, and the virulent germ propagates itself. It can be propagated by the washing of vegetables or other aliments. The first measure which should be rigorously prescribed is to use only cooked aliments, in which the microbe cannot exist.

The treatment recommended by him in the beginning is opium, which must be discontinued as soon as the algide state is reached; stimulants may then become necessary, though he could indicate none. As soon as chilliness sets in, nothing can be done. He washes his hands in a solution of bichloride of mercury, $\frac{1}{1000}$, eats only well-cooked food, and drinks only boiled water.

Before leaving Toulon, Dr. Koch addressed the following communication to the Council of Hygiene:

Cholera propagates itself in assemblages of men; its principle is unexceptionally communicated by direct contact with men, or with their wearing apparel.

In cholera times, a well-regulated life must be led; experience has demonstrated that troubles of digestion favor an attack of cholera. Excesses in eating and drinking, the use of heavy, indigestible food, must be avoided, and also anything which may cause diarrhœa. A physician should be called in immediately. Never absorb anything which comes from a contaminated source; when in doubt whence it came, subject it to a thorough cooking, and especially so milk.

Water tainted by human detritus is forbidden; avoid the use of doubtful water, of water drawn from shallow wells or a swamp, a pond, or from a creek receiving vitiated water. Consider as essentially dangerous water which has been in any manner soiled by choleric dejections. Water which has been used for rinsing vessels, or washing of clothing, should not be poured into a well or into a running stream. It is impossible to get absolutely pure water, the simplest way is therefore to have it boiled.

These observations refer not only to water used for drinking, but to water used in the household; for the choleric germ, once existing in the water, can be communicated to all who make use of it, whether in the laundry, scullery, kitchen or bath. The most important consequences of these remarks are, that it is not sufficient to guard against cholera, to use pure, or even boiled water.

One case of cholera can become the focus of an epidemic, hence cholera patients should be removed from contact with all those not absolutely necessary to take care of them.

Public assemblages, fairs, fetes, should be avoided. Never eat or drink in a room where the choleric are; their dejections should be collected in vessels containing a phenic solution.

All objects soiled by the dejections should be cleansed with dry cloths, which have to be burned immediately. Apartments which have been occupied by the choleric should remain vacant for six days.

Persons who are brought in contact with cholera patients, should wash their hands with soap and phenic acid, or solution of bichloride of mercury $\frac{1}{1000}$. Cadavers should be removed immediately, and the funerals should be simplicity itself. The cortege should not enter the mortuary house, and none of the objects belonging to the choleric should be removed without having been previously disinfected.

Laundresses should not receive the linen coming from a choleric, without having undergone thorough disinfection.

OPACITIES OF THE CORNEA.—Dr. Michel recommends sulphate of cadmium, of the strength of two and a half grains to the ounce of mucilage, as an application to opacities of the cornea. A camel's-hair brush, dipped in this wash, is applied to the centre of the spot and retained in contact with it for a few seconds. At first the application is made once a day, but after a while is repeated two or three times in the twenty-four hours. When the pain grows less, the strength of the solution may be increased to five grains or even seven grains to the ounce. When the opacity is of recent formation it readily disappears under this treatment, but when it is of old date the applications must be long continued. (Practitioner, Jan., p. 53.)

BOOK REVIEWS.

THEORY AND PRACTICE OF MEDICINE. By FREDERICK T. ROBERTS, M.D. Illustrated. Fifth American Edition. Publishers, P. Blakiston, Son & Co.

This work is so well known to American Medical men that an extended notice of it is superfluous. The present edition consists of a single volume of a thousand pages. Numerous additions have been made to the subject matter in order to incorporate the most recent discoveries. The characteristics of the work are fullness without prolixity. The work is, as it always has been, an excellent manual.

FOREIGN CORRESPONDENCE.

LONDON LETTER.

THE PATENT MEDICINE STAMP ACT—THE ENGLISH BOARD OF INLAND REVENUE DECISION AGAINST NOSTRUMS, SPECIFICS, AND LEGITIMATE FOREIGN DRUGS.

LONDON, July 14, 1884.

The recent decision of the Board of Inland Revenue against legitimate foreign drugs, as well as all patent medicine, has caused great dissatisfaction among both the medical and pharmaceutical professions throughout the Kingdom. It appears that the action of the Board was made specially upon the medicinal preparations of Park, Davis & Co., many of which are now being largely used in GREAT Britain. The Stamp Act of 1812, which has thus been unjustly interpreted by the board against the profession of this country, was in vogue when both pharmacy and medicine were in their infancy. English pharmacists and physicians no longer depend upon their own home products for fine preparations and good therapeutic results, but upon the valued remedies obtained from all parts of the world. In other words, the great strides of these two professions in England have outgrown this obsolete Stamp Act, and the decision recently rendered has caused universal regret. In fact, the English physicians and pharmacists are most liberal in all matters that concern their respective departments. They are anxious —in truth, enthusiastic—to test the merits of all preparations that may come from any nation on the earth, and especially desirous of using American drugs. During my short stay in London, in visiting the various hospitals, I have been most agreeably surprised to find the large quantity of American and other foreign drugs that are in constant use in these institutions. The therapeutists connected with these hospitals, who are ranked as the best and most scientific in the world, are the most liberal and progressive in their opinions. For instance, the collection of drugs used by Dr. William Murrell, one of the most prominent teachers of Materia Medica and Therapeutics at the Westminster School, includes all the recent preparations, both simple and compound, found in use at the present day. There was convallaramin and all the other important alkaloids, and jequirity, and even a full line of those useful and practical remedies, the oleates, that have been introduced and so largely manufactured by Dr. Lawrence Wolff, the chemist, of Philadelphia. A full line of foreign drugs are not used alone in the institution just named, but in all the schools in this great European medical centre. It can therefore be clearly seen what a great inconvenience and dissatisfaction the recent decision of the Board of Inland Revenue will create. It will limit the usefulness of therapeutics in the United Kingdom. This increase of price on legitimate foreign drugs by the patent-medicine Stamp act will place them, in the great majority of cases in practice, beyond general use by practitioners for their patients. English physicians are practical in all matters, and they always study economy for the sake of those they serve so well. This unfortunate Stamp act has, however, operated largely in favor of patent medicines ever since it has been in existence. Thus, the government stamps officially all worthless trash, and the gullible public are impressed with the conviction that the drug so highly endorsed must be good, pure, and perfect. The most ingenious, as well as poisonous combinations are thus easily, under the protection of the government, dispensed without a word of caution to the people. I am pleased, however, to see that the profession are awake to the needs of the times, and are actively pushing a bill before Parliament which will eradicate all the abuses of this act. The bill has a very large support, and the profession are all convinced that it will soon pass and become a law that will benefit the people directly. S.

DOMESTIC CORRESPONDENCE.

BOSTON LETTER.

The Annual Meeting of the Massachusetts Medical Society for the current year, constituting the one hundred and third (103) anniversary, was held in Boston, June 10 and 11. The number of members present was unusually large, and there was a great amount of interest in the proceedings of the meeting. The weather was fine. The arrangements for the meeting were admirably conducted by a strong committee consisting of six of the most energetic, public-spirited of the younger physicians of Boston, aided by the hearty coöperation of a large corps of able and willing assistants.

The anniversary exercises were inaugurated by an invitation to the Fellows of the Society to visit and inspect the Massachusetts General Hospital, the City Hospital, the new Children's Hospital, and the Lying-in Hospital. These institutions were the object of attention on the part of many of the Society until 12 o'clock, when the larger number of delegates assembled in the spacious hall of the new Harvard Medical School to listen to the address of Prof. H. P. Bow-

ditch on "Methods of Instruction and Research in Physiology with Demonstrations." The address was of great interest, and portrayed and illustrated the vast advances which have been made in the science of Physiology and in the modes of teaching, whereby laboratory experiments and absolute demonstrations have replaced to a great extent the tiresome didactic lectures of a few years ago. During the essay various experiments illustrative of the methods employed in physiological research were performed before the audience to their great satisfaction.

Dr. Thos. Dwight, Professor of Anatomy, also gave a lecture and demonstration illustrative of the improvements which have been devised both for the didactic and for the experimental teaching of this important branch of the medical art, and the Fellows of the Society were shown the manner in which the dissection of subjects has been so influenced by modern hygiene, that even this most repulsive part of a student's curriculum has been made tolerable, if not attractive. The demonstrations of anatomy for which Prof. Dwight is justly celebrated were very interesting and the Society testified its appreciation of their practical character and artistic execution. At 3 P. M. Dr. Geo. W. Gay, Surgeon to the Boston City Hospital, described the "Peuster Posterior Splint in Fractures of the Leg" and made a practical application of the splint to a patient before the audience. An extended description of this apparatus is deferred at this time, as it is hoped that a full report of Dr. Gay's paper with illustrations may soon appear, which will be forwarded to the JOURNAL as early as possible. Any further attempt to do justice to the subject at this time would extend this letter to an unwarrantable length.

An adjourned meeting of the Society was held at 4 o'clock, for the transaction of business, and this proved to be the most exciting event in the entire list of anniversary exercises. In order to be understood it will be necessary to refer to a similar meeting held two years ago for the same general purposes. At that time the office of President of the Society was held by Dr. H. W. Williams, one of the most prominent members of the profession in New England, a gentleman whose uniform suavity of manner and courtesy of bearing, combined with a dignified presence, concealed and masked a firmness of character and a pertinacity of disposition which in any other man would have seemed like obstinacy. On the occasion mentioned, in 1882, the subject of the eligibility of women for and their admission to the rights and privileges of the State Society was brought before the meeting. The same subject had been touched upon once or twice previously at the annual meetings of the Society, but had been easily disposed of on each occasion. The disorder had, however, become gradually more and more extended, and each year a larger number of members had become infected with heresy until now the movement had acquired a dangerous importance. At the annual meeting in 1882, the subject was therefore formally introduced and brought before the meeting for discussion. There was an evident feeling that the measure would be adopted by the Society, and the friends of the good old principles of the profession which have been fostered by the Society for more than a century trembled at the proximity of the ballot which they saw would demolish their idol of conservatism at one fell blow.

It was at this supreme moment that the then President of the Society, Dr. Williams, executed a stroke of genius in chairmanship which won for him the plaudits of the sympathizers and achieved again a victory for the conservative element of the Society. When the danger was most imminent, when the offensive doctrine h .d found shape and voiee and had been presented to the meeting in the classical form of a motion, then the chairman ruled the motion out of order on the ground that by a strained reading of one clause of the By-laws of the Society, the Board of Councillors and the Society at large must conjointly ratify any amendment to the organic laws of the Society before these laws can be changed. By the reading of the clause in question, the chairman claimed that it appeared that the Councillors must take the iniation, and the society was powerless to originate a motion to amend its own By-laws; but was subject to the pleasure of a Board of Councillors which the Society had itself created. To the more ardent and impetuous members of the Society, especiall yamong the younger men, this step looked like an attempt to muzzle the Society, and to virtually establish a ring rule which would entirely subvert any voluntary expression or action on the part of the general Society. Some impulsive spirit ventured at this time to appeal from the decision of the chair, and after a spirited debate the decision of the chair on that occasion was sustained by a bare majority. This action placed the troublesome question of the admission of women at rest for the time being. Last year it showed but a slight degree of recuperation, but like Banquo's ghost it stalked into the meeting of this year in all its hideousness and would not be banished. The large attendance, the growing conviction that the threatened measure was sooner or later an inevitable issue, coupled with the fact that a certain amount of work had been done by a self-appointed committee looking to this object, all conspired to render the subject a more formidable one this year than ever before. As may be imagined, the friends and the enemies of the measure were present in full force.

The meeting had hardly been called to order and the records of the previous meeting been read, when the venerable Dr. Henry I. Bowditch arose, and in a clear, ringing voice, moved the proposed amendment to the By-laws of the Society, which reads as follows: "Candidates for admission to the Massachusetts Medical Society may be male or female, and must by proper credentials and examination satisfy the censors of said Society that they possess the following qualifications for fellowship" * * * etc.

The motion was seconded, and was ably advocated by its friends, and vigorously opposed by its foes, and finally the question was called for.

The President of the Society, Dr. A. Hosmer, immediately fell back upon the precedent established by his illustrious predecessor of two years ago, and promptly ruled the motion out of order. A scene of

wildest disorder at once ensued, in which the decision of the chair was appealed from in twenty directions at once, and speakers were vainly endeavoring to make themselves heard in all parts of the hall. Amid much confusion, a motion to reconsider the vote of two years ago was presented, and seconded and debated. The question was called for and was again summarily ruled to be out of order by the chairman. Again the decision of the chair was appealed from, and for a time it was quite impossible for the chairman to control the meeting.

At length, when quiet was in some degree restored, and the ridiculous position of affairs became apparent, there being two motions before the house, neither of which had been put, and two rulings of the chair, both of which had been appealed from, the chairman at length seemed to perceive that it was impossible to further prevent or pervert the natural course of events in parliamentary proceedings, and the questions were accordingly taken up *seriatim*. First, the appeal from the ruling of the chair that the motion of Dr. Bowditch was out of order, was decided by a large majority against the chairman. The original motion of Dr. Bowditch was again put, and declared lost. The vote was doubted, a standing vote was demanded, which gave a majority of about 75 for the amendment. A committee consisting of Dr. Henry I. Bowditch and Dr. Morrill Wyman was appointed to report the action of the general Society to the councillors at their meeting in the evening, and to move its passage in that body. Here, also, a last determined resistance was made to the passage of the vote, but after a lengthy debate it was adopted by the Council, and to-day for the first time in the history of the Massachusetts Medical Society, woman is accounted equally eligible with man for fellowship in its rights and its privileges.

On the following day, June 10, the annual reports of the Society were presented, the names of those removed by death, and of those added to the Society, were read, and the announcement was made that the membership was increased to about fifty more than its roll one year ago.

A paper was read by Dr. F. Nickerson, of Lowell, on "A Case of Chylous Deposit in the Abdomen." Dr. L. Huntress, of Lowell, read a paper on "The Pitch of Percussion Sounds," which was followed by a debate in which Drs. Henry I. Bowditch, G. M. Garland, and others, took part. Dr. J. F. A. Adams read an interesting essay on "Sanitary Forest-Culture," which was followed by an animated debate, in which Drs. H. O. Marcy, Albert N. Blodgett, and others, took part. At the conclusion of the discussion, the subject of forest-culture was referred to the Committee on Legislation of the Society, and by unanimous vote the name of Dr. Adams was added to that committee, which was instructed to endeavor by all proper means to secure such legislative enactments as may be necessary to check the wholesale destruction of the forests in our country, which will otherwise soon experience a famine of wood and lumber; and to call public attention to the sanitary influence of forest trees and timber lands upon the inhabitants. Dr. Blodgett called especial attention to the efforts made in foreign lands to cultivate forest trees and to reproduce timber in districts adapted to its culture, as well as the strict regulations observed in the destruction of forests or individual trees, even on private domain.

Dr. J. Seaverns, of Roxbury, then presented an essay on "Weight as an Indication of the Character of Risks for Life Insurance." This was a study of the mortality in a series of about 300 cases of death occurring in the membership of a coöperative Life Insurance Company, divided into groups varying in the ratio of 15 per cent. and 25 per cent. both above and below the normal standard from age and height, as established in the well-known mortality tables of the insurance companies.

At twelve o'clock the annual oration was delivered by Dr. John Crowell, of Haverhill, and at one o'clock the Society walked in procession by seniority to the skating rink, where the Annual Dinner was served.

After ample justice had been rendered to the repast, the Anniversary Chairman, Dr. Geo. B. Shattuck, arose, and in a few felicitous words introduced the President of the Society for the ensuing year, Dr. Chas. D. Homans, of Boston, who was greeted with cordial applause.

The retiring President was then called upon and spoke at some length of the history of the Society, its powerful influence for good, its endeavors to sustain the dignity and integrity of the profession, and its promises for the future.

The Governor of the Commonwealth, His Excellency, Hon. Geo. D. Robinson, was now introduced by the chairman, and for nearly half an hour held the Society spellbound by his eloquence. He touched upon many of the important relations which the profession of medicine maintains toward the public, the system of health inspection, the powers and province of State and local Boards of Health; the practical working of the system of Medical Examiners introduced some years ago; and suggestions for the future development and usefulness of this important department of public medicine. His Excellency could not refrain from congratulating the Society on its action of yesterday in admitting women to its fellowship, and expressed the opinion that the result to the public, to the profession, and to the women themselves would be only for good. Remarks were made by representatives of the sister professions, theology and the law, all uniting in congratulating the Society upon its increasing prosperity and the ever extending influence which it is gaining upon the public through its beneficent ministrations.

At about 4 o'clock the Society adjourned.

Looking back upon the anniversary just past, by far the most striking feature in its deliberations is the action by which the doors of the Society have been opened to women. This event will be looked upon by the friends of the measure as the beginning of a new epoch in the annals of the Society, and can be compared in magnitude only with another memorable action by the Society about fifteen years ago, when it expelled a portion of its body as unfit for longer membership on account of supposed inclina-

tions toward homœopathy. This measure engendered much rancor at the time both within and without the Society, and is now very generally regarded as a stupendous mistake. Whether in a few years the members of the Society will look back with similar misgivings on their action in regard to *women* is a question. From private sources it is learned that steps have been already taken by some of the women here engaged in practice, to obtain admission to the Society, but this consummation is still far from a reality at present on account of certain prohibitory enactments in the standing resolves of the Councillors, prohibiting their admission to examinations by the censors of the Society, one resolution even providing for the legal defence of the censors in case of judicial proceedings on account of a refusal to examine female candidates for fellowship. By what means or at what time these disabilities and restrictions will be removed by the Board of Councillors remains to be seen. The champions of the women feel that they have achieved a brilliant victory, and assert that the triumphant entrance of the gentler sex into the full membership of the Society will be speedily accomplished, while many grave and decorous physicians are hoping and praying (I think they pray) that the Councillors by their deliberate and conservative methods may still avert the dreaded amalgamation for some time yet.

EDITOR OF JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

The following has already appeared in several American as well as European journals, and among the number may be mentioned the *Medical Press* and *Circular:*

LACK OF REFINEMENT IN THE AMERICAN MEDICAL ASSOCIATION.—A resident of Washington writes to the New York *Medical Journal* as follows: "The usual disgraceful performances took place at the receptions. Mrs. L—— generously opened her beautiful house, and provided as fine a table as Demenet could serve. She was rewarded by having men stalk in (hats on their heads) from the front room to the dining-room, where they fought like wolves for places at the tables, overturning piles of plates, breaking her expensive ornaments, and soiling her rugs with pools of tobacco-juice."

The author of this slander will, in all probability, never be known, excepting to the editor of the New York *Medical Journal*, who appears to have given it circulation without attaching the name of its puerile Washington correspondent.

I have the facts in my possession from the highest authority on this question that: "*The guests were most courteous and civil.*"

J. F. JENKINS, M.D.

Tecumseh, Mich., July 28, 1884.

HEADACHE.—*Menthol.*—This drug has never failed to relieve my own headache, or any nervous headache in my care. I simply wet the finger with the following mixture, and pass it several times over the forehead: ℞. Menthol, ʒj; alcohol, ʒj; olei caryophylli, olei cinnam., āā ♏xx. M. (Dr. F. O. Lockwood, Therapeutic, Gazette, Oct., 1883.)

MISCELLANEOUS.

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RICHARD J. DUNGLISON, M.D.,
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Wright, J. P., Major and Surgeon, assigned to duty as Post Surgeon, San Antonio, Texas. (By per. 4 S. O. 87, Hdqrs. D. of Texas, July 14, '84).

Wright, J. P., Major and Surgeon, granted leave of absence for one month, on surgeon's certificate of disability. (Par. 3 S. O. 89, Hdqrs. D. of Texas, July 17, '84).

Hartsuff, Albert, Major and Surgeon, leave of absence extended one month. (5. O. 79, Hdqrs. Div. of the Mo., July 18, '84.

Strong, Norton, 1st. Lieut. and Asst. Surgeon, granted leave of absence for two months, to take effect when relieved from duty in Dept. of the Platte. (Par. 2 S. O. 68, Hdqrs. Div. of the Mo., June 27, '84.)

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